MONTHLY WEATHER REVIEW.

Editor: Prof. CLEVELAND ABBE.

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INTRODUCTION.

The MONTHLY WEATHER REVIEW for May, 1901, is based on reports from about 3,100 stations furnished by employees and voluntary observers, classified as follows: regular stations of the Weather Bureau, 159; West Indian service stations, 13; special river stations, 132; special rainfall stations, 48; voluntary observers of the Weather Bureau, 2,562; Army post hospital reports, 18; United States Life-Saving Service, 9; Southern Pacific Railway Company, 96; Hawaiian Government Survey, 200; Canadian Meteorological Service, 32; Jamaica Weather Office, 160; Mexican Telegraph Service, 20; Mexican voluntary stations, 7; Mexican Telegraph Company, 3; Costa Rica Service, 7. International simultaneous observations are received from a few stations and used, together with trustworthy newspaper extracts and special reports.

Special acknowledgment is made of the hearty cooperation of Prof. R. F. Stupart, Director of the Meteorological Service of the Dominion of Canada; Mr. Curtis J. Lyons, Meteorologist to the Hawaiian Government Survey, Honolulu; Señor Manuel E. Pastrana, Director of the Central Meteorological and Magnetic Observatory of Mexico; Camilo A. Gonzales, Director-General of Mexican Telegraphs; Mr. Maxwell Hall, Government Meteorologist, Kingston, Jamaica; Capt. S. I. Kimball, Superintendent of the United States Life-Saving Service; Commander Chapman C. Todd, Hydrographer, United States Navy; H. Pittier, Director of the Physico-Geographic Institute, San Jose, Costa Rica; Captain François S. Chaves, Director of the Meteorological Observatory, Ponta Delgada, St. Michaels, Azores, and W. M. Shaw, Esq., Secretary, Meteorological Office, London; Rev. Josef Algué, S. J., Director, Phillipine Weather Service.

Attention is called to the fact that the clocks and self-registers at regular Weather Bureau stations are all set to seventy-fifth meridian or eastern standard time, which is exactly five hours behind Greenwich time; as far as practicable, only this standard of time is used in the text of the REVIEW, since all Weather Bureau observations are required to be taken and recorded by it. The standards used by the public in the United States and Canada and by the voluntary observers are believed to conform generally to the modern international system of standard meridians, one hour apart, beginning with Greenwich. The Hawaiian standard meridian is 157° 30′, or $10^h\ 30^m$ west of Greenwich. The Costa Rican standard of time is that of San Jose, $0^h\ 36^m\ 13^s$ slower than seventy-fifth meridian time, corresponding to $5^h\ 36^m$ west of Greenwich. Records of miscellaneous phenomena that are reported occasionally in other standards of time by voluntary observers or newspaper correspondents are sometimes corrected to agree with the eastern standard; otherwise, the local standard is mentioned.

Barometric pressures, whether "station pressures" or "sea-level pressures," are now always reduced to standard gravity, so that they express pressure in a standard system of absolute measures.

FORECASTS AND WARNINGS.

By Prof. E. B. GARRIOTT, in charge of Forecast Division.

Forecasts of the direction and force of the wind and the state of the weather for the first three days out for the use of steamers bound east from United States ports were regularly made during the month and published on the weather maps issued at Washington, Baltimore, Philadelphia, New York, and Boston, and on a number of dates these forecasts included a notice that conditions favorable for fog were indicated along the western half of the transatlantic steamer routes. On the 3d Lloyds, London, England, was advised by cable that a storm of marked strength was crossing Newfoundland moving eastward.

The most important disturbance of the month in the United States belonged to a type of storms which apparently originate on the eastern slope of the Rocky Mountains, and move thence eastward or northeastward over the Great Lakes, often increasing in intensity, and causing dangerous east to northeast shifting to north and northwest gales. On May 22 the disturbance referred to assumed definite form on the eastern Rocky Mountain slope and moved almost due east over the southern part of the Lake region during the succeeding two days, attended on the 24th by severe gales on Lakes Michigan, Huron, Erie, and Ontario. In this instance the strength of the gales appeared to be due to the rapid development of an area of high barometer over the Lake Superior region rather than to an increase in intensity of the low barometer disturbance. Although ample warning was given to lake ports of the dangerous character of the winds that would attend this storm several small sailing craft were wrecked, and the steamer *Baltimore* ran ashore and was lost off Au Sable, Lake Huron.

Frost occurred on the 4th in the upper Ohio Valley and western New York, and on the 5th in the Rocky Mountain districts as far south as northern New Mexico. On the 6th and 7th frost was reported in the middle-western and northwestern States, and on the 8th from the middle Rocky Mountain region over Minnesota and upper Michigan. From the 10th to the 14th frost conditions extended from the northeastern slope of the Rocky Mountains over the Northwestern States and the upper Mississippi and Ohio valleys, and on the 15th and 16th frost occurred generally in the Lake region. On the 18th and 19th frost was noted in the north Pacific

coast States, from which district it extended over the middle and northern Plateau regions on the 20th and 21st and the Northwestern States on the 22d. During the 25th and 26th frost conditions extended from the Northwestern States over the upper Lake region. The frosts of the month were, as a rule, accurately forecast on the days preceding their occurrence.

Heavy rains caused freshets and damaging floods in the rivers of eastern Tennessee, eastern Kentucky, West Virginia, Virginia, and the Carolinas from the 21st to the 24th. Timely advices or flood warnings were issued in connection with the more important floods in the several States named. On the 16th the Willamette River passed the danger line, 15 feet, at Portland, Oreg. The daily stages of the Willamette were accurately forecast. In Cuba much damage was caused on the 21st and 22d by freshets resulting from heavy rain.

CHICAGO FORECAST DISTRICT.

Frost extended over the Northwest on the 10th, 11th, 12th, and 13th, warnings for the occurence of which were sent out in advance.

A storm moved from the Rocky Mountain region across the central valleys during the 23d and 24th, which was followed by an unusually rapidly rising barometer over the northern Lake region. On the morning of the 23d storm warnings were ordered on Lake Superior for "brisk to high east shifting to north winds." The forecast issued that day for Lakes Michigan and Huron was "brisk and possibly high southerly winds, becoming variable Friday; showers and squalls." On the morning of the 24th northeast storm warnings were extended over Lakes Michigan and Huron, and warning was given to vesselmen that the winds would be dangerous northerly. Several wrecks occurred on the 24th during this storm, and some lives were lost, although high winds were reported only on Lake Michigan and at Duluth. The steamer *Baltimore* in seeking shelter in the storm ran aground in Lake Huron off Au Sable and met with total loss. The other vessels wrecked were generally small sailing craft.—*H. J. Cox, Professor.*

SAN FRANCISCO FORECAST DISTRICT.

The month was remarkable chiefly for the unsettled weather conditions which prevailed during the last decade. The total rainfall at San Francisco was .69 inch (which is the normal for the last thirty years), .66 inch of this fell after May 20. Unusually heavy rains occurred in Utah on the 3d and 4th, a 24-hour rainfall of 2.32 inches being reported at Salt Lake City. An area of high pressure which followed a disturbance that was central over northern Utah and southern Idaho on the 21st was accompanied by killing frosts generally in Nevada and southern Utah. An unusually large number of thunderstorms were reported from the 24th to the 27th.—*A. G. McAdie, Forecast Official.*

PORTLAND, OREG., FORECAST DISTRICT.

No severe storms occurred and no storm warnings were displayed.

Forecasts of frost were issued on the 2d, 17th, 19th, 21st, 29th, and 30th, and they were generally verified.

River forecasts for Portland and The Dalles, Oreg., were made and published daily from the 15th. On the 14th the river at Portland began to rise rapidly and passed the danger-line, 15 feet, the evening of the 16th, and continued above the danger-line the remainder of the month. The daily stages were forecast two or three days ahead, and no 24-hour forecast varied more than three-tenths of a foot from the stage reached, while forecasts for longer periods were relatively as accurate. Large property interests were endangered, but no losses of consequence occurred.—*E. A. Beals, Forecast Official.*

HAVANA, CUBA, FORECAST DISTRICT.

No warnings were issued during the month. Excessive rains on the 21st and 22d caused considerable damage in Havana and vicinity, and high winds and floods caused damage over the island.—*W. B. Stockman, Forecast Official.*

AREAS OF HIGH AND LOW PRESSURE.

Movements of centers of areas of high and low pressure.

Number.	First observed.			Last observed.			Path.		Average velocities.	
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long. W.	Length.	Duration.	Daily.	Hourly.
High areas.		°	°		°	°	*Miles.*	*Days.*	*Miles.*	*Miles.*
I	1, a. m.	54	114	5, a. m.	39	88	2,025	4.0	506	21.1
II	4, a. m.	51	114	9, a. m.	48	85	1,400	3.0*	467	19.5
III	10, a. m.	53	118	18, a. m.	48	54	4,100	7.0†	586	24.4
IV	24, a. m.	51	104	27, p. m.	28	98	1,925	3.5	550	22.9
Sums							9,450	17.5	2,109	87.9
Mean of 4 paths							2,362		527	22.0
Mean of 17.5 days									540	22.5
Low areas.										
I	1, a. m.	46	106	10, p. m.	40	74	2,625	5.0‡	525	21.9
II	1, p. m.	47	87	3, a. m.	50	64	1,000	1.5	667	27.8
III	6, p. m.	51	120	12, a. m.	48	71	2,600	5.5	473	19.7
IV	12, a. m.	47	84	14, a. m.	48	68	800	1.5§	533	22.2
V	17, a. m.	45	88	18, a. m.	46	74	700	1.0	700	29.2
VI	18, a. m.	39	77	19, p. m.	34	78	425	1.5	283	11.8
VII	19, a. m.	30	103	24, a. m.	48	54	3,425	5.0	685	28.5
VIII	22, a. m.	46	106	25, a. m.	37	76	1,775	3.0	592	24.7
IX	25, a. m.	32	86	28, a. m	41	70	1,575	3.0	525	21.9
Sums							14,925	27.0	4,983	207.7
Mean of 9 tracks							1,658		554	23.1
Mean of 27 days									553	23.0

* Stationary for 2 days. † Stationary for 1 day.
‡ Stationary for 4½ days. § Stationary for ½ day.

RIVERS AND FLOODS.

The stage of the Mississippi River was somewhat lower than during the preceding month, although it remained quite high below the mouth of the Ohio River. The upper Missouri River was higher, and a general rise was in progress as far as Kansas City, Mo., at the close of the month. The Ohio River stages averaged considerably lower than during April, 1901, although they were high during both the opening and closing days of the month.

Flood stages were experienced along the Tennessee River, and the following report of the upper Tennessee flood was prepared by Mr. L. M. Pindell, official in charge of the Weather Bureau office at Chattanooga, Tenn.:

Barometric depressions passed over the Southern States from the 18th to 22d and produced exceedingly heavy rainfall over the Tennessee River system from Chattanooga to the extreme headwaters, beyond our rainfall stations, flooding every stream and tributary, and causing one of the worst floods known over upper east Tennessee, particularly over the tributaries on the south side, including the Holston, Little Tennessee, Hiwassee, Nolachucky, Wautauga, and other streams. The Clinch, French Broad, and Powells did not have as much rainfall over their drainage areas. The total rainfall at the various stations in this center from the 18th to the 22d, inclusive, was as follows:

	Inches.
Murphy, N. C	7.62
Charleston, Tenn	7.13
Bryson, N. C	5.57
Asheville, N. C	5.04
Chattanooga, Tenn	5.26
Kingston, Tenn	4.13
Speers Ferry, Va	3.93
Greeneville, Tenn	3.73
Bluff City, Tenn	3.52
Bridgeport, Ala	3.45
Knoxville, Tenn	3.32
Clinton, Tenn	3.24
Rogersville, Tenn	3.01
Tazewell, Tenn	2.49
Florence, Ala	1.05
Riverton, Ala	0.91

From the above table it will be seen that the rain was light at Riverton, Ala., became heavier as it moved to Bridgeport, Ala., Chattanooga and Charleston, Tenn., and was the heaviest at Murphy, N. C., becoming lighter as it moved northeastward to Virginia. The river reached 19.8 feet at 8 a. m. on May 22, at Speers Ferry, Va., which was within two-tenths of the danger line; at Bryson, N. C., on the 21st, the river was at 11.5 feet; at Knoxville, Tenn., the water reached 34.8 feet at 2 p. m. on the 23d, or 5.8 feet above the danger line; it was 3.7 feet higher than in April, 1886, when the river reached 52.2 feet at Chattanooga, and 4.2 feet below the freshets of 1867 and 1875. At Charleston, Tenn., the river reached 23.5 feet at 8 a. m. May 22, or 1.5 feet above danger line. The Clinch at Clinton, Tenn., reached 26 feet at 8 a. m. May 24, or 1 foot above danger line, but did not quite reach the danger line at Kingston, Tenn. The Tennessee at Chattanooga reached 33.5 feet between 10 and 11 p. m. on May 26; it did not quite reach the danger line (24 feet) at Bridgeport, Ala., or Riverton, Ala. (25 feet), and passed the danger line at Florence, Ala., by two-tenths (16.2 feet).

The river at Chattanooga, rose slowly, about one-tenth of a foot an hour for sixteen hours after it had begun to fall at a point about 50 miles above. The rise at Chattanooga was unusually prolonged; it rose for eighty-three hours after it had begun to fall at Knoxville; about one hundred hours after it had begun to fall at Charleston, and sixty hours after it had started to go down at Kingston, Tenn. On the morning of the 23d the observer at Knoxville was notified that the river would reach about 35 feet by the morning of the 24th, and the river observer at Kingston was informed that the Clinch would reach a stage of 24 feet by Friday morning, May 24. Several private telegrams received from persons on the river below Chattanooga, as well as telephone messages, were replied to at once, giving them desired information relative to stages expected at various points between Chattanooga and Florence and whether it was necessary to move live stock off the islands. As far as can be learned, no loss due to lack of warning occurred on the river below Knoxville. The actual loss to crops in the river bottoms can never be estimated.

The loss and damage to the upper east Tennessee towns and country is estimated at $3,000,000. The press dispatches state that Elizabethton, Tenn., is a wrecked town, and the loss and damage there is placed at $1,000,000. The Doe River has changed its course and runs through the residence section and over the ruins of many homes. All the stores in Allentown, Tenn., were swept away and 1,000 people were without food. Saw mills, homes, bridges (wood and steel) were all swept away by the flood, as well as much live stock. The number of persons drowned is placed at 14. At Asheville, N. C., the damage to the Southern Railway is estimated at $500,000. No eastern mail was received in this city for three days. All the railroads in east Tennessee suffered by reason of washouts and loss of bridges and tracks.

Over the lower Tennessee the flood was more moderate, and was remarked upon as follows by Mr. P. H. Smyth, official in charge of the Weather Bureau office at Cairo, Ill.

Heavy rains over the upper Tennessee watershed on May 18, 19, and 20, caused the lower river to rise from the 20th to the 31st. At Florence, Ala., the crest stage was 16.25 feet, reached at 10 a. m. on the 28th (May). At Johnsonville, Tenn., the crest stage was 22.7 feet, and occurred on the 31st. The maximum stage predicted for Johnsonville was 24 feet, and for Florence, 16 feet. No damage resulted from the high stage of the river, except to growing crops. Bottom lands were inundated in some places. Ample warning was furnished to places interested.

A remarkable feature of the flood, and one that was anticipated, was the comparatively low crest stages reached at points on the lower river. The crest stage reached at Chattanooga was 33.5 feet, which would, in the average case, give Florence about 21.5 feet, and Johnsonville about 33 feet.

The comparatively low crest stages at Florence and Johnsonville were due to the fact that, when the rise set in, the lower Tennessee was at a low stage and the lower Ohio at a comparatively low stage.

A flood of marked proportions also occurred in the James River, and its history is given herewith by Mr. E. A. Evans, official in charge of the Weather Bureau office at Richmond, Va.:

Showery weather had prevailed over the James River basin for several days prior to the 22d, wetting the soil and establishing a condition favorable to a maximum run off. In addition the percentage of humidity was high, and the skies cloudy, so that evaporation was much retarded. Hence when the heavy rains occurred on the 22d all conditions were extremely favorable for high water. During the forenoon of this date special rainfall telegrams were received from Buena Vista, Cliftonforge, Lynchburg, and Columbia, Va., reporting precipitation of 1.90, 1.30, 1.26, and 1.00 inches, respectively, and in the afternoon and early night from Charlottesville, Columbia, and Lynchburg, Va., reporting 5.20, 2.00, and 1.40 inches, respectively. At 4:45 p. m. advisory flood warnings were issued locally and also telegraphed to Sabot and Charlottesville, Va. The river at this time was low, but began to rise after midnight. At the morning observation of the 23d it was reading 10.8 feet, rising. Final warnings were then issued locally, forecasting a 21 foot rise from the lowest point a day or two before, and for upper river points between Lynchburg and Columbia, of 14 feet. At 1:10 p. m. the local gage reading was 13.2 feet, at 4 p. m. 14.7 feet, and at 7 p. m. 16.0 feet, still rising. By this hour the river was sufficiently high to cover a large area of the low-lying business section of Cary and Dock streets, while the steamboat wharfs and Lester and lower Main streets had been under water since about 2 p. m. These conditions had been anticipated, however, as early in the forenoon the messenger had been sent out to personally notify parties living in the districts liable to inundation of the expected rise. The telephone was also used freely, and this, together with the newspaper warnings issued, amply prepared the people living in the threatened districts in time for them to take such precautions as their situations required.

Throughout the night the river rose steadily, invading an increasing area of the business sections. In the early morning it had reached Main and Franklin streets in the vicinity of the "Old Market," driving out hucksters and others, running in on the first floors of business houses and compelling a complete cessation of business. Persons desiring to get to the lower part of the city had to be ferried across the streets in row boats. The river front from Fifteenth to Twenty-fifth streets and from Twenty-eighth street to the city limits was under from 1 to 3 feet of water, while those portions of the city adjacent to Shockoe and Gillies creeks were also flooded. The yards of the Trigg Shipbuilding Company were submerged and many wholesale houses and manufactories were obliged to close down.

At 6 a. m. on the 24th the gage reading was 19.3 feet; 7 a. m., 18.9; 8 a. m., 19.0; 10 a. m., 19.2; 11:30 a. m , 18.9; 5 p. m., 18.3; 10 p. m. 17.7. During the night the river continued falling slowly, receding from the streets of the city, and by morning of the 25th, when the gage read 14.5 feet, most of the business portions were free from water and clearing up of debris was in progress. The docks were still under water, also Main street at Twenty-eight street, and a portion of Lester street, and it was not expected that they would be clear until nightfall, information to this effect being sent to the navigation companies. Throughout the day the river continued to fall and by night was within its banks.

The freshet was of considerable magnitude, being the highest since March, 1889, yet the damage to property was quite small, and in nearly all cases to fixed objects. The warnings issued were generally heeded by the people.

The same heavy rains that caused the Tennessee and James rivers floods also caused others in the New and Great Kanawha rivers. At Charleston, W. Va., the Great Kanawha River reached a stage of 38.5 feet, 2.1 feet above the stage of April, 1901, and 8.5 feet above the danger line. Mr. S. S. Bassler, official in charge of the Weather Bureau office at Cincinnati, Ohio, has furnished the following account of this flood:

The remarkably heavy rains that occurred over southern Ohio, West Virginia, and more especially the regions affecting the New River on the 21st of May, 1901, resulted in a swift flood of decided and destructive proportions in the New and Kanawha rivers, and a consequent rise in the Ohio below Point Pleasant, W. Va.

On the morning of the 22d the report from Radford, Va., indicated a stage of 23 feet, a rise of 21.3 feet in the New River at that point. This was already 9 feet above the danger line. At 10:33 a. m. on the 22d, a telegraphic warning was rushed to Hinton, W. Va., as follows: "River will pass your danger line to-day. Heavy rains above you and great rise at Radford." A special 2 p. m. report from Radford on the 22d showed the river to have risen to 26 feet and still rising, and Charleston, W. Va., was telegraphed at 3:40 p. m., as follows: "Radford, 2 p. m., 26 feet. Heavy rains. You will have sharp rise, reaching danger line Thursday."

Headquarters of all Kanawha interests located in Cincinnati were

promptly notified and all took immediate action looking to the protection of their floating property on the Kanawha, telegraphing the information to their people.

The maximum stage reached at Radford, Va., was 26.4 feet at 3:30 p. m. on the 22d. This was 12.4 feet over the danger line. A special on the same day from Hinton, W. Va., showed that by 6 p. m. the river had exceeded the danger line 4 feet and come to a stand 18.8 feet by 9 p. m., remaining at that stage until near midnight

On the morning of the 23d the report from Charleston, W. Va., showed a stage of 36.6 feet, a rise of 29.7 feet in the past twenty-four hours. A crest of about 39 feet was forecast, and a maximum of 38.5 feet reached at 1 p. m. of the 23d. The river remained stationary at that stage until 3 p. m. of the same day.

On the 24th the Kanawha rise had again subsided and no serious effect was produced upon the Ohio River, the resulting crest stage at Cincinnati being 35.9 feet on the morning of the 26th. The local crest stage forecast several days previous was between 36 and 38 feet.

Mr. Arthur Roberts, special river observer at Radford, Va., reports, as follows: "Great damage was done to farmers all along New River; impossible to estimate the loss. The damage to the Norfolk and Western Railway Company, by bridges and tracks washing out, will probably amount to $20,000."

Miss Vella V. Flanagan, special river observer at Hinton, W. Va., reports, as follows: "The official information was timely and of great benefit. It gave the people time to get out themselves and to pack up their household effects. There were five one-story houses taken entirely away and three others practically rendered worthless, part of one being taken away. Lumber and farming interests above this point also suffered severely."

Mr. J. W. Crider, special river observer at Charleston, W. Va., reports in part, as follows: "Several tipples and barges from farther up the river were swept away. What damage was done was principally to cellars and houses located in the lowlands. The public had a better warning of this rise than ever before. * * * I personally notified a number of firms here to get their goods out of their cellars to places of safety. We also kept the railroad officials posted, and the warning saved a good many bridges and trestles which otherwise would have been swept away. The warning was given them in time to weight the bridges, etc., down with loaded cars. The value of the warning can hardly be estimated in dollars and cents, but had it not been given promptly thousands of dollars additional loss would have occurred. The United States Engineers in charge of the Kanawha River improvements, with their telephone service, spread the warning up and down the river to the various towns and mines."

It will be seen from these accounts that all the high waters were well anticipated by the Weather Bureau warnings. The flood forecasts were timely, and afforded another example of the great value of this branch of the service.

The Brazos River was somewhat higher during the month, particularly over the lower portion. The service on this river was improved during the month by the opening of a new special at Booth, Tex. On the Pacific coast the only item of interest was the annual rise of the Columbia River. It was in progress during the entire month, and at the close of the month the stages in the lower river were but a few feet below the danger lines. At Portland, Oreg., on the Willamette River, the back water caused a stage of 19.9 feet on the 31st, 4.9 feet above the danger line. Special river bulletins were issued daily from the Weather Bureau office at Portland during the flood, and a detailed report thereof will appear in the WEATHER REVIEW for June.

The highest and lowest water, mean stage, and monthly range at 137 river stations are given in Table VII. Hydrographs for typical points on seven principal rivers are shown on Chart V. The stations selected for charting are: Keokuk, St. Louis, Memphis, Vicksburg, and New Orleans, on the Mississippi; Cincinnati and Cairo, on the Ohio; Nashville, on the Cumberland; Johnsonville, on the Tennessee; Kansas City, on the Missouri; Little Rock, on the Arkansas; and Shreveport on the Red.—*H. C. Frankenfield, Forecast Official.*

CLIMATE AND CROP SERVICE.

By JAMES BERRY, Chief of Climate and Crop Service Division.

The following summaries relating to the general weather and crop conditions are furnished by the directors of the respective sections of the Climate and Crop Service of the Weather Bureau.

[Temperature is expressed in degrees Fahrenheit and precipitation in inches and hundredths.]

Alabama.—The mean temperature was 69.8°, or 1.4° below normal; the highest was 99°, at Bermuda on the 16th, and the lowest, 40°, at Opelika on the 27th. The average precipitation was 5.08, or 1.88 above normal; the greatest monthly amount, 9.34, occurred at Valley Head, and the least, 2.32, at Florence.

Several cool spells, especially a decided one during the latter part of the month, seriously retarded growth of late planted corn and cotton. Hailstorms quite frequent and in some places damaging.—*F. P. Chaffee.*

Arizona.—The mean temperature was 70.4°, or 2.2° below normal; the highest was 107°, at Mohawk Summit on the 6th, and the lowest, 22°, at Flagstaff on the 22d. The average precipitation was 0.44, or 0.09 above normal; the greatest monthly amount, 3.38, occurred at Fort Defiance, while none fell at a number of stations.

While the early ripening of wheat and barley has been retarded by an unusual amount of cloudiness and by temperature generally below the seasonal average, the conditions otherwise have been favorable for the filling of grain, and crops yielding more than average seem to be assured.—*W. G. Burns.*

Arkansas.—The mean temperature was 68.2°, or 1.8° below normal; the highest was 100°, at Jonesboro on the 2d, and the lowest, 31°, at Pond on the 26th. The average precipitation was 2.95, or 1.65 below normal; the greatest monthly amount, 7.85, occurred at Blanchard, and the least, 0.49, at Pond.

The drought continued during the first two weeks of the month and did considerable damage to all growing crops. The drought was broken on the 12th, and after that date good rains were generally well distributed throughout the State. Some corn and cotton had to be replanted. These crops are now coming up to fair to good stands and are being worked out. Cotton chopping progressing rapidly. Wheat and oats damaged by dry weather and insects. Rust has made its appearance in some wheat. Irish potatoes are generally good, but have been slightly injured by bugs. The fruit prospects continue good, but in a few localities peaches, plums, and cherries are beginning to drop off.—*E. B. Richards.*

California.—The mean temperature was 62.0°, or 1.7° below normal; the highest was 108°, at Volcano on the 16–18th and 31st, and the lowest, 16°, at Bodie on the 1st. The average precipitation was 1.03, or 0.11 below normal; the greatest monthly amount, 3.87, occurred at Cuyamaca, while none fell at 5 stations.

Frequent and unusually heavy rains during the month materially improved the condition of wheat, rye, barley, and oats, benefited orchards and vineyards, and gave new life to pasturage. Hay was considerably damaged in some localities, but the yield will be heavy. The grain crop will equal and possibly exceed the average yield. Deciduous fruits are in better condition than expected a month ago.—*Alexander G. McAdie.*

Colorado.—The mean temperature was 55.5°, or 1.0° above normal; the highest was 92°, at Blaine on the 9th and at Delta on the 19th, and the lowest, 15°, at Durango on the 5th and 22d. The average precipitation was 2.34, or 0.42 above normal; the greatest monthly amount, 10.52, occurred at Alford, and the least, trace, at Hugo.

Weather conditions more favorable than usual for seeding, planting, germination, and stooling, but hardly ideal for the advancement of corn. Serious damage to crops in eastern part of Larimer County on the 20th–22d by heavy rains, flooding, and hail. Destructive hailstorms in localities of Las Animas County on the 11th and Huerfano County on the 27–29th. Some damage by frost on the 26th in eastern border counties.—*F. H. Brandenburg.*

Cuba.—The mean temperature was 78°; the highest was 100°, at Holguin, Santiago Province, on the 10th and 11th, and the lowest, 50°, at Rosario (Aguacate), Havana Province, on the 1st, and Santa Clara, Santa Clara Province, on the 1st and 11th. The average precipitation was 9.03; the greatest monthly amount, 20.27, occurred at Matanzas, Matanzas Province, and the least, 1.99, at Manzanillo, Santiago Province.

The severe drought conditions which obtained throughout the island at the end of the first week, when in different portions of the island cisterns mostly were empty, wells running dry, springs failing, ponds dry, and stock water was scarce, and in southeast Puerto Principe some of the people did not have water with which to cook, were ameliorated over the greater portion of the western four provinces by abundant

rains during the second week, and over the remainder of the island during the third week. Abundant to excessive rains continued over the western four provinces during the fourth week, and generally were very beneficial, although some damage was done to crops in northeast Pinar del Rio, southwestern Havana, and southwestern Matanzas. Over the remainder of the island the rains of the fourth week were generally abundant and beneficial, except in southeastern Santiago, where they were insufficient, and did not admit of soil cultivation. The majority of sugar centrals had completed their grinding under normal conditions, except at Banaguises, where the excessive rainfalls caused the cessation of grinding, while 12,500 tons of available cane was still standing.—*W. B. Stockman.*

Florida.—The mean temperature was 75.1°, or 0.5° below normal; the highest was 98°, at Eustis on the 15th and at McAlpine and Quincy on the 24th, and the lowest, 43°, at Middleburg on the 28th. The average precipitation was 4.38, or 1.47 above normal; the greatest monthly amount, 10.42, occurred at Miami, and the least, 1.45, at Earnestville.

Farm work made fair progress during the month. The bulk of the cotton crop was chopped and corn was well cultivated. Precipitation was excessive over a large portion of the State. On lowlands some damage resulted to cotton and vegetables. Cane, cassava, and melons did well. Citrus fruits dropped considerably; small shipments of pineapples were made from the southern district.—*A. J. Mitchell.*

Georgia.—The mean temperature was 71.4°, or about normal; the highest was 99°, at Mauzy on the 24th, and the lowest, 40°, at Clayton on the 29th. The average precipitation was 5.71, or 2.49 above normal; the greatest monthly amount, 10.39, occurred at Dahlonega, and the least, 2.71, at Savannah.

The weather of the month was unfavorable to crops. The excessive rains of the latter portion prevented proper cultivation and vegetation became infested with weeds and foreign matter. The general situation at the close of the month was regarded as very discouraging.—*J. B. Marbury.*

Idaho.—The mean temperature was 57.1°, or 3.2° above normal; the highest was 99°, at Garnet on the 16th, and the lowest, 19°, at Soldier on the 20th. The average precipitation was 1.43, or 0.37 below normal; the greatest monthly amount, 3.80, occurred at Priest River, and the least, 0.28, at Idaho City.

The mean temperature for May was the highest on record. There were no severe storms, but the rapid melting of snow as the result of warm weather, caused considerable damage to bridges along several streams, especially the Wood River, where, at Star, one bridge was washed away.—*S. M. Blandford.*

Illinois.—The mean temperature was 61.7°, or 1.3° below normal; the highest was 94°, at St. John on the 1st, Ottawa on the 2d, Cisne, Mount Vernon, and New Brunside on the 3d, and the lowest, 29°, at Lanark on the 26th. The average precipitation was 1.96, or 2.12 below normal, the greatest monthly amount, 5.02, occurred at Sullivan, and the least, 0.45, at Coatsburg.

After the first few days the month was generally cool and the growth of vegetation was greatly retarded. A few frosts occurred, but the damage caused by them was slight. Dry weather caused some injury to crops over most of the State, though in a few localities the rainfall was sufficient.—*M. E. Blystone.*

Indiana.—The mean temperature was 60.7°, or 1.9° below normal; the highest was 95°, at Terre Haute on the 2d, and the lowest, 31°, at Salem, Cambridge, Richmond, and Ambrose on the 13th. The average precipitation was 2.54, or 1.43 below normal; the greatest monthly amount, 5.89, occurred at Huntington, and the least, 0.82, at Washington.

Warm, sunny weather at the beginning of May advanced all crops and farm work; trees and shrubs which were leafless at the close of April were green at the end of the first week of May. Wheat, rye, grass, clover, and timothy grew well; early-sown oats, barley, tobacco, and potatoes came up nicely; fruits, except apples, were in full bloom. Plowing progressed rapidly and corn planting begun. Cool weather and frequent light and badly distributed rains prevailed in the middle and latter parts of the month, retarding plowing and planting and the growth of crops. In the southern portion wheat was jointing, rye heading, and all the oats were sown. Near the end of the month heavy hailstorms damaged crops considerably in several localities; a number of sheep and calves were either killed or injured in Jackson County; wheat was heading; the injury by the fly was increasing; rye matured well; oats looked poor; tobacco was transplanted. Corn was not all planted; the early crop came up slowly, and cut worms did much damage. Late potato planting begun; early potatoes grew well. Tree fruits were very promising, but apples dropped badly; strawberries were ripe; blackberries were in bloom. Livestock was in good condition.—*C. F. R. Wappenhans.*

Iowa.—The mean temperature was 60.7°, or 1.0° above normal; the highest was 95°, at Clear Lake on the 2d and 17th, and the lowest, 28°, at Larrabee on the 12th. The average precipitation was 2.35, or 1.62 below normal; the greatest monthly amount, 4.57, occurred at Belle Plaine, and the least, 0.72, at Belknap.

Weather conditions quite variable, the first and third weeks being much warmer than usual, and the second and fourth weeks much colder; the average for the month being slightly above normal. Deficient rainfall materially affected the crops of oats, wheat, barley, and hay, which will not be fully recovered however favorable the weather in future. Corn was generally clean at close of month, though checked in growth and uneven in stand.—*John R. Sage.*

Kansas.—The mean temperature was 63.1°, or 1.2° below normal; the highest was 95°, at Ulysses on the 10th, and the lowest, 25°, at Achilles on the 26th. The average precipitation was 1.63, or 2.03 below normal; the greatest monthly amount, 4.12, occurred at Independence, and the least, 0.18, at Lebanon.

Cool, dry month. Wheat headed and begun blooming, some local injury by fly and smut. Apple trees bloomed. Corn came up, good stands in southern counties, with medium or poor stands in many other counties, and much replanting to be done, being cultivated, growth retarded by cool weather. Oats poor stand. Cankerworm began injuring some orchards.—*T. B. Jennings.*

Kentucky.—The mean temperature was 63.7°, or 2.1° below normal; the highest was 97°, at Hopkinsville on the 5th, and the lowest, 34°, at Loretto on the 14th. The average precipitation was 2.65, or 1.31 below normal; the greatest monthly amount, 5.11, occurred at Warfield, and the least, 1.21, at Centertown.

The first week was warm and quite favorable to growing crops and farm work, but the remainder of the month was too cool and there was a lack of sunshine. Light frost occurred at some stations on the 26th, but no serious damage resulted. These unfavorable conditions checked the growth of all crops and made the season very backward. At the close of the month not more than half the tobacco was set out and the plants were very small. Corn and gardens were very late. Wheat, oats, and rye were in fair condition. Apples dropping badly, but other fruits were promising. Cutworms were numerous during the month.—*H. B. Hersey.*

Louisiana.—The mean temperature was 72.3°, or 1.9° below normal; the highest was 95°, at Covington on the 1st and at Schriever on the 15th, and the lowest, 41°, at Oxford on the 27th and at Robeline on the 28th. The average precipitation was 2.08, or 1.04 below normal; the greatest monthly amount, 7.20, occurred at Lake Providence, and the least, trace, at Opelousas.

Droughty conditions prevailed in the central, southern and southwestern portions of the State throughout the month, and all crops suffered more or less in consequence. The bad effects of the long period of dry weather were minimized, however, by active and thorough cultivation of the crops that were up. A considerable acreage of cotton, rice, and cow peas planted during the month had not yet come up at its close. Sweet potato planting was delayed and all crops were about two weeks late. Rain was fairly plentiful in the northern parishes, and exceeded crop needs in the northeast corner of the State.—*W. T. Blythe.*

Maryland and Delaware.—The mean temperature was 61.3°, or 1.7° below normal; the highest was 95°, at Boettcherville, Md., on the 25th, and the lowest, 25°, at Deerpark, Md., on the 4th. The average precipitation was 4.47, or 0.52 above normal; the greatest monthly amount, 9.56, occurred at Frostburg, Md., and the least, 2.17, at Distributing Reservoir, D. C.

Large number of rainy days and surplus rainfall hindered farm work to some extent, delaying corn planting especially. The deficiency in temperature and sunshing retarded growth at times. The month as a whole, however, was favorable to crops, and at its close winter grain, corn, potatoes, tobacco, truck, and fruit were promising; hay crop promises to be below the average. Strawberries and June peas were yielding well at the close of the month.—*Oliver L. Fassig.*

Michigan.—The mean temperature was 54.2°, or 0.5° below normal; the highest was 90°, at Ewen on the 8th, and the lowest, 18°, at Gaylord on the 15th. The average precipitation was 2.47, or 0.70 below normal; the greatest monthly amount, 5.65, occurred at Fitchburg, and the least, 0.40, at Ontonagon.

May was generally an unfavorable month for much crop growth and especially for the germination of spring seeding. There were no wide departures from normal temperature or normal precipitation, but the month was practically devoid of any hot spells, which are so valuable in seed germination, while the nights were almost uniformly cool. Corn has suffered most, some seed rotting and much of it taking from ten to fourteen days to germinate.—*C. F. Schneider.*

Minnesota.—The mean temperature was 58.2°, or 2.0° above normal; the highest was 95°, at Ada on the 1st, and the lowest, 23°, at Newfolden, on the 11th. The average precipitation was 1.41, or 1.25 below normal; the greatest monthly amount, 4.97, occurred at Bemidji, and the least, trace, at Thief River Falls.

There were periods of warm weather on the 1st, 2d, 16th, 17th, and 18th, and periods of cool weather on the 11th, 12th, 13th, 24th, and 25th, with freezing temperatures and frosts, which, on the latter dates, affected corn, gardens, and barley in exposed places, but without permanent injury. The cool weather was beneficial to spring wheat and oats, but it retarded the growth of corn. Dry weather in northern counties permitted seeding on lands too wet to plow last fall and wet early this season. Early sown grains have not been in want of rain, though the surface soil was very dry at times, but late sown grains and flax were slow in germinating till the rains of the 22d and 23d.—*T. S. Outram.*

Mississippi.—The mean temperature was 70.7°, or 2.1° below normal; the highest was 95°, at Brookhaven on the 11th, Edwards on the 16th, and Aberdeen and Agricultural College on the 24th, and the lowest, 38°, at Aberdeen on the 27th. The average precipitation was 4.09, or 0.83 above normal; the greatest monthly amount, 12.20, occurred at Edwards, and the least, 0.48, at Bay St. Louis.

The deficiency in rainfall during the last of April and first half of May caused the oat crop to make a light yield. The unusually low temperature during the last decade of the month retarded the growth of all crops, and in some sections was quite injurious to cotton.—*W. S. Belden.*

Missouri.—The mean temperature was 63.7°, or 1.3° below normal; the highest was 98°, at Unionville on the 18th, and the lowest, 30°, at Edwards and Montreal on the 26th. The average precipitation was 1.48, or 3.80 below normal, the least precipitation for any May during the past fifteen years; the greatest monthly amount, 3.77, occurred at St. Charles, and the least, 0.19, at Birchtree.

At only a few scattered stations did the precipitation of the month exceed 50 per cent of the normal amount, while over a large part of the State it was less than 25 per cent. At St. Joseph, Mexico, Shelbina, Hermann, Boonville, Glasgow, Sedalia, and Ironton, where observations have been continued for more than twenty years, and also at Miami, where they cover a period of fifty-three years, it was the driest May on record. Over portions of the central and southern sections hardly enough rain fell at any one time between April 17 and the close of May to thoroughly lay the dust. In some counties corn planting could not be finished, the ground being too hard to plow. Corn came up poorly and much replanting was necessary. Except in portions of the northern sections, all growing crops suffered more or less from lack of moisture, and in many counties wheat, oats, and meadows were greatly injured.—*A. E. Hackett.*

Montana.—The mean temperature was 58.8°, or 4.3° above normal; the highest was 104°, at Poplar on the 17th, and the lowest, 17°, at Glenwood on the 3d, and at Adel and Kipp on the 10th. The average precipitation was 2.98, or 0.66 above normal; the greatest monthly amount, 8.48, occurred at St. Peters, and the least, trace, at Glendive and Wibeaux.

The precipitation over central Montana has been exceptionally large and about normal in the west portion, but there has been a deficiency in the east portion, which has made the prospect for a hay crop very poor.—*E. J. Glass.*

Nebraska.—The mean temperature was 60.5°, or 1.0° above normal; the highest was 96°, at Lynch on the 1st, and the lowest, 26°, at Lynch on the 12th. The average precipitation was 1.86, or 1.63 below normal; the greatest monthly amount, 5.29, occurred at Dawson, and the least, 0.10, at Wauneta.

The deficiency in rainfall affected winter wheat and oats unfavorably, especially in the southwestern portion of the State, where considerable damage resulted. Oats are thin stand. Corn was planted in good season under favorable conditions, but the low temperature the last half of the month has been unfavorable to germination and growth, and corn is coming up unevenly, but generally the stand is good.—*G. A. Loveland.*

Nevada.—The mean temperature was 56.2°, or 0.3° below normal; the highest was 94°, at Palisade on the 15th, and the lowest, 19°, at Palmetto on the 2d. The average precipitation was 0.86, or 0.81 below normal; the greatest monthly amount, 3.79, occurred at Palmetto, while none fell at Battle Mountain.

Cold nights during the month retarded the growth of vegetation, especially alfalfa and garden truck, which were very backward at the close of the month. There were no injurious frosts and the prospects for plenty of fruit were very promising.—*J. H. Smith.*

New England.—The mean temperature was 54.6°, or 0.7° below normal; the highest was 91°, at Plymouth, N. H., on the 22d, and the lowest, 24°, at Grafton, N. H., on the 6th. The average precipitation was 5.83, or 2.03 above normal; the greatest monthly amount, 10.49, occurred at Provincetown, Mass., and the least, 0.75, at Kineo, Me.

No destructive or severe storms have occurred during the month. The precipitation has been heavy, and at many stations has been greater than that of any other May on record. No extremely low temperatures have occurred, but there has been a marked absence of warm days, and the average maxima have been low. As a result of the excessive precipitation and cloudiness the ground has been saturated with water, delaying farm work about two weeks later than the usual season. Grass has made a rapid and luxuriant growth, but other crops are backward.—*J. W. Smith.*

New Jersey.—The mean temperature was 58.6°, or 2.0° below normal; the highest was 90°, at Indian Mills on the 24th, and the lowest, 29°, at Charlotteburg on the 6th. The average precipitation was 5.60, or 1.10 above normal; the greatest monthly amount, 8.13, occurred at River Vale, and the least, 3.10, at Freesburg.

Excessively wet, cool, cloudy weather has prevailed, retarding farm work and also growth and maturing of early truck. Wheat, rye, and oats, have obtained a good growth, but are lodged badly in many fields.—*E. W. McGann.*

New Mexico.—The mean temperature was 61.1° or 0.2° below normal; the highest was 105°, at San Marcial on the 11th, and the lowest, 27°, at Fort Wingate on the 2d. The average precipitation was 1.69, or 0.77 above normal; the greatest monthly amount, 5.92, occurred at Fort Union, while none fell at Gage, San Marcial, and Strauss, and only a trace at Deming, Engle, Fort Bayard, Lordsburg, Mesilla Park, Olio, and Silver City.

Unusually favorable month in northern and eastern sections, where the rainfall was excessive. Elsewhere the precipitation was lighter than usual, but the month as a whole not unfavorable..—*R. M. Hardinge.*

New York.—The mean temperature was 55.6°, or 0.4° below normal; the highest was 89°, at Jay on the 22d, and the lowest, 26°, at Bolivar on the 16th. The average precipitation was 5.13, or 1.13 above normal; the greatest monthly amount, 8.75, occurred at Mohonk Lake, and the least, 1.78, at Avon.

The first half of May was pleasant and generally favorable for farming interests. Cool, cloudy weather, with almost continuous rains, characterized the latter half of the month, delaying plowing and planting to a serious degree. Grass and winter grains made a luxuriant growth, and fruits, other than apples, promised well. No killing frosts occurred.—*E. T. Turner.*

North Carolina.—The mean temperature was 66.8°, or 0.2° below normal; the highest was 97°, at Southern Pines on the 3d and at Selma on the 4th, and the lowest, 32°, at Linville on the 4th and at Highlands on the 28th. The average precipitation was 7.94, or 3.76 above normal; the greatest monthly amount, 12.63, occurred at Marion, and the least, 3.99, at Hatteras.

The first decade of May was very favorable for farm work and for the growth of crops, but the remainder of the month was entirely too wet, and immense damage was caused by the floods from the 22d to 25th, during which time many rivers attained the highest stages ever known. Many fields of fine wheat were destroyed. Crops were generally poor and small and badly in need of cultivation at the close of the month.—*C. F. von Herrmann.*

North Dakota.—The mean temperature was 60.0°, or 8.7° above normal; the highest was 99°, at Berthold Agency and Medora on the 17th, and the lowest, 19°, at Napoleon and New England City on the 12th. The average precipitation was 0.31, or 2.11 below normal; the greatest monthly amount, 0.98, occurred at Fargo, and the least, trace, at Berthold Agency, Grafton, Melville, Steele, and Valley City.

The month was an unusually dry one, and at its close all vegetation that was above ground was suffering for moisture, while late sown grain had not sprouted. Grass was dying in all parts of the State, and prospects seemed very gloomy.—*B. H. Bronson.*

Ohio.—The mean temperature was 59.0°, or 1.8° below normal; the highest was 90°, at Portsmouth on the 24th, and the lowest, 26°, at Hillhouse on the 15th. The average precipitation was 3.96, or 0.38 above normal; the greatest monthly amount, 7.77, occurred at Bucyrus, and the least, 1.62, at Cincinnati.

The temperature for the month has been below normal. An extensive frost occurred on the 13th, the temperature falling to freezing or below at many central and northern stations. Slight damage to crops resulted, but the great bulk of the fruit crop escaped injury. The weather has been favorable for grain and grass crops, fairly good for potato and truck crops, but too cool and wet for corn.—*J. Warren Smith.*

Oklahoma and Indian Territories.—The mean temperature was 67.6°, or 1.4° below normal; the highest was 97°, at Lehigh, Healdton, and Ryan, Ind. T., on the 10th, and the lowest, 24°, at Kenton, Okla., on the 3d. The average precipitation was 5.39, or 0.68 above normal; the greatest monthly amount, 12.25, occurred at Mangum, Okla., and the least, 1.65, at Wagoner, Ind. T.

Generally fair weather, with cool nights, prevailed during the month. General and heavy rains occurred over the section from the 13th to the 18th and on the 30th and 31st, being excessive in some portions. Wheat, barley, and rye were heading and filling out well. Oats were badly damaged by insects and will be very short. Corn was in good condition and cotton was somewhat backward. Grass was good and stock thriving. A severe hailstorm did considerable damage in Canadian County. All vegetation in the path of the storm was almost totally destroyed. On the same day a severe storm passed over Custer County, wrecking several houses and causing severe damage to growing crops.—*Charles M. Strong.*

Oregon.—The mean temperature was 56.3°, or 1.3° above normal; the highest was 96°, at McMinnville on the 30th, and the lowest, 17°, at Silverlake on the 3d. The average precipitation was 2.03, or 0.66 below normal; the greatest monthly amount, 6.38, occurred at Bay City, and the least, 0.12, at Burns.

Crops in general made satisfactory growth during the month. Plowing and seeding were completed about the 15th instant, and at the close of the month fall wheat, rye, and barley had begun to head and spring grain, grasses, and hops were in excellent condition.—*Edward A. Beals.*

Pennsylvania.—The mean temperature was 58.9°, or 0.7° below normal; the highest was 91°, at York on the 24th, and the lowest, 28°, at Smethport on the 16th. The average precipitation was 5.56, or 0.69 above normal; the greatest monthly amount, 7.96, occurred at Hamlinton, and the least, 2.24, at Erie.

Weather of May was generally favorable for agricultural interests. The heaviest rainfalls were reported over the northeast and southwest

sections; in some places the total fall was nearly 8.00 inches, but the average for the State was less than 1.00 inch above the normal. During the last week in the month frequency of rains interfered somewhat with planting of crops, besides checking germination Temperatures were mostly seasonable; some cool weather in the middle of the month and some few noticeably warm days in the latter half. No damaging frosts occurred. Winter grain and grass made splendid growth during entire month. Wheat and rye are especially heavy in straw, and good yields are generally expected. Excepting apples and cherries, fruit prospects are very good.—*T. F. Townsend.*

Porto Rico.—The mean temperature was 79.3°, or 1.1° above normal; the highest was 97°, at Hacienda Coloso on the 4th, San German on the 21st, 29th, and 30th, and at Canovanas on the 26th, and the lowest, 57°, at Ponce on the 23d. The average precipitation was 9.41, or 0.48 above normal; the greatest monthly amount, 23.05, occurred at Isolina, and the least, 1.35, at Ponce.

The wet weather over north and central portions retarded farming operations, but, as a rule, farm work was well advanced at the close of the month. Some places, especially over the southern portion of the district of Ponce, drought prevailed. Some sugar cane was planted. The showers were exceptionally favorable for young canes. Grinding was slightly retarded in some sections by the continued rains. The yield of cane is not as good as was anticipated, and rains have caused a slight decrease in the grade of juice. The weather has been very favorable for coffee. A few new coffee plantations have been started, and weather for planting was all that could be desired. Some coffee on lowland in the Mayaguez district was about ready for gathering at the close of month.—*Joseph L. Cline.*

South Carolina.—The mean temperature was 71.4°, or 0.3° below normal; the highest was 99°, at Gillisonville and Temperance on the 3d, and the lowest, 40°, at Greenwood on the 28th. The average precipitation was 7.31, or 4.03 above normal; the greatest monthly amount, 13.08, occurred at Winthrop College, and the least, 2.17, at Beaufort.

The meteorological conditions throughout the month were unfavorable to field crops. Early in the month the ground was too dry to germinate seed, and poor stands of cotton, corn, and other crops were secured. The latter portion was overabundantly supplied with moisture to the physical injury of lands and crops, but seed that had lain dormant now sprouted rapidly and perfect stands were the rule. The latter portion was too cool for cotton.—*J. W. Bauer.*

South Dakota.—The mean temperature was 60.5°, or 3.0° above normal; the highest was 98°, at Ashcroft on the 17th, and the lowest, 20°, at Ashcroft on the 11th. The average precipitation was 1.77, or 0.96 below normal; the greatest m nthly amount, 3.64, occurred at Centerville and Sisseton Agency, and the least, 0.18, at Interior.

Frost over the eastern portion of the State on the 12th and 25th injured early corn and potatoes, and fruit bloom, principally of plums, was considerably damaged, materially reducing the prospect for a crop. Corn and potatoes, however, generally recovered promptly and made fairly good progress during the latter part of the month. Drought injured some spring wheat, oats, and barley, retarded the growth of grass, and delayed germination of late sown grains in some parts of the middle and upper Missouri Valley. Generally the weather was favorable for spring wheat, oats, and spring and winter rye. Grass generally afforded good pasturage and at the close of the month the prospect for hay was good.—*S. W. Glenn.*

Tennessee.—The mean temperature was 65.1°, or 2.2° below normal; the highest was 93°, at Johnsonville and Springfield on the 2d, Liberty on the 3d and 4th, and at Covington on the 25th, and the lowest, 34°, at Rugby on the 30th. The average precipitation was 3.90, or 0.26 above normal; the greatest monthly amount, 8.60, occurred at Benton, and the least, 1.30, at Union City.

The weather was dry and unfavorable for the germination of seeds and growth of plants from the 1st to 17th, after which time there was abundant moisture, but unseasonably low temperature. Crops generally made unsatisfactory progress; there was much replanting to be done on account of poor stands, and in many bottom lands on account of overflows and drowning of plants. Local hailstorms were frequent and unusually disastrous during the second half of the month. Tobacco plants were mostly set out the last week of the month and under favorable conditions.—*Roscoe Nunn.*

Texas.—The mean temperature was 73.5°, or 0.8° below normal; the highest was 102°, at Fort McIntosh on the 11th, and the lowest, 41°, at Amarillo on the 26th. The average precipitation was 3.42, or 0.07 below normal; the greatest monthly amount, 12.97, occurred at Wichita Falls, while none fell at Valentine.

Cotton planting was completed early in the month. The plant, while healthy, is growing slowly, and on account of so much replanting is very irregular. The crop is generally about two weeks late. Early cotton in the southern portion of the State is fruiting. Corn has been greatly improved, is in roasting ear over the southern portion, and is tasseling and silking over the central portion of the State. The acreage seeded to rice is much larger than was anticipated. Sugar cane is doing well, but more rain would improve the crop. The fruit crop is good; peaches and plums are being marketed.—*I. M. Cline.*

Utah.—The mean temperature was 59.3°, or 2.7° above normal; the highest was 98°, at Hite on the 17th, and at Green River on the 19th, and the lowest, 15°, at Loa on the 4th. The average precipitation was 1.29, or 0.16 above normal; the greatest monthly amount, 4.77, occurred at Farmington, and the least, trace, at Emery and Smithville.

Remarkably heavy rainfall occurred over Davis, Salt Lake, the northern portion of Utah, and the eastern portion of Tooele counties from the 2d to the 4th. Farmington received 4.61 and Salt Lake City 4.08 inches. The amount which fell at Salt Lake City greatly exceeds the precipitation of any other storm shown by the records of that station.—*L. H. Murdoch.*

Virginia.—The mean temperature was 63.1°, or 1.5° below normal; the highest was 95°, at Buckingham on the 1st, and the lowest, 32°, at Cliftonforge on the 6th. The average precipitation was 5.49, or 1.38 above normal; the greatest monthly amount, 10.32, occurred at Grahams Forge, and the least, 2.20, at Alexandria.

The weather of the month was, in the main, favorable for crop progress, though toward its latter part a period of cool, rainy weather set in, which checked growth of vegetation and interrupted farm work. Many washing rains occurred, doing considerable damage to corn, wheat, and tobacco, and producing flood rises in all the streams of the State.—*Edward A. Evans.*

Washington.—The mean temperature was 55.3°, or 0.5° above normal; the highest was 99°, at Lind on the 26th, and the lowest, 24°, at Republic on the 10th. The average precipitation was 2.18, or 0.24 below normal; the greatest monthly amount, 10.06, occurred at Neah Bay, and the least, 0.35, at Lyle.

There was too little sunshine and too many cool and frosty nights for rapid growth, but the staple crops made fair progress, and at the end of the month the winter and spring wheat crops were in promising condition.—*G. N. Salisbury.*

West Virginia.—The mean temperature was 61.8°, or 1.1° below normal; the highest was 96°, at Beverly on the 24th, and the lowest, 21°, at Philippi on the 4th. The average precipitation was 6.15, or 1.94 above normal; the greatest monthly amount, 8.88, occurred at Oceana, and the least, 2.50, at Parsons.

Cool, rainy weather retarded farm work and checked the growth of vegetation, yet at the close of the month wheat and rye were in nearly average condition, and meadows promised a fairly good yield; corn planting and oat sowing were about completed, and plowing nearly up to date; oats and corn made slow growth on account of the cool nights; the prospect for a large crop of all kinds of fruit was exceptionably favorable.—*E. C. Vose.*

Wisconsin.—The mean temperature was 55.9°, or 0.9° above normal; the highest was 93°, at Medford on the 17th, and the lowest, 21°, at Spooner on the 25th. The average precipitation was 2.29, or 1.51 below normal; the greatest monthly amount, 4.20, occurred at Wausau, and the least, 0.48, at Ladysmith.

The month as a whole was rather less favorable for growing crops than usual, both on account of the general, and in some sections, serious deficiency of moisture and the prevailing northeast winds. Corn planting was practically completed by the end of the month, but germination was slow, and the early plantings where up presented a yellowish, unhealthy appearance. The growth of grass and pastures was retarded by the dry weather.—*W. M. Wilson.*

Wyoming.—The mean temperature was 55.6°, or 4.1° above normal; the highest was 97°, at Alcova on the 18th, and the lowest, 23°, at Daniel on the 1st. The average precipitation was 2.55, or 0.60 above normal; the greatest monthly amount, 4.81, occurred at Griggs, and the least, 0.96, at Daniel.

The abundant and well distributed rainfall of the month put the ranges in the best condition they have been in for several years, and have assured an excellent crop of native hay.—*W. S. Palmer.*

SPECIAL CONTRIBUTIONS.

CLIMATOLOGY OF COSTA RICA.

Communicated by H. PITTIER, Director, Physical Geographic Institute.

TABLE 1.—*Hourly observations at the Observatory, San Jose de Costa Rica, during May*, 1901.

Hours.	Pressure.		Temperature.		Relative humidity.		Rainfall.		
	Observed, 1901.	Normal, 1889-1900.	Observed, 1901.	Normal, 1889-1900.	Observed, 1901.	Normal, 1889-1900.	Observed, 1901.	Normal, 1889-1900.	Duration, 1901.
	660+ *Mm.*	660+ *Mm.*	° *C.*	° *C.*	%	%	*Mm.*	*Mm.*	*Hrs.*
1 a. m.	3.90	3.84	17.44	17.92	88	91	0.0	0.8	0.00
2 a. m.	3.87	3.47	17.13	17.67	88	91	0.0	0.7	0.00
3 a. m.	3.38	3.23	16.76	17.50	89	90	0.0	1.3	0.00
4 a. m.	3.37	3.21	16.42	17.34	90	90	0.0	0.6	0.00
5 a. m.	3.52	3.44	16.33	17.18	89	90	0.0	0.5	0.00
6 a. m.	3.78	3.79	16.43	17.10	88	90	0.0	0.7	0.00
7 a. m.	4.17	4.21	18.39	18.88	76	84	0.0	0.2	0.00
8 a. m.	4.34	4.52	21.76	21.00	64	76	0.0	0.5	0.00
9 a. m.	4.46	4.66	23.77	22.88	57	70	0.0	0.6	0.00
10 a. m.	4.40	4.56	25.77	24.55	52	64	0.0	0.1	0.00
11 a. m.	4.12	4.35	26.72	25.37	51	63	0.0	0.5	0.00
12 m.	3.79	3.92	26.80	25.83	53	63	1.7	1.4	0.63
1 p. m.	3.32	3.30	26.83	25.67	54	63	31.7	4.6	1.33
2 p. m.	2.97	2.81	25.27	24.51	61	68	17.6	18.5	2.83
3 p. m.	2.73	2.55	23.48	23.06	68	74	31.5	21.5	2.80
4 p. m.	2.79	2.52	22.05	21.74	75	78	28.1	40.4	4.58
5 p. m.	2.96	2.73	21.09	20.87	78	83	4.5	36.4	1.58
6 p. m.	3.38	3.19	20.36	20.06	81	86	8.3	34.2	1.42
7 p. m.	3.76	3.65	19.86	19.39	85	88	4.2	26.6	2.00
8 p. m.	4.12	4.03	19.47	19.08	85	89	1.1	20.1	1.33
9 p. m.	4.35	4.35	19.00	18.82	87	90	0.1	11.7	1.00
10 p. m.	4.48	4.64	18.64	18.40	88	90	0.1	5.5	0.67
11 p. m.	4.40	4.60	18.16	18.32	88	91	0.0	3.4	0.00
Midnight	4.21	4.29	17.73	18.10	88	91	0.0	1.6	0.00
Mean	3.76	663.75	20.89	20.46	76	81	.....	.....	.....
Minimum	661.20	660.43	12.8	11.9	.....	.....	.....	.....	.....
Maximum	665.90	667.12	31.4	32.5	.....	.....	24.1*	40.4	.....
Total	.....	.....	.....	.....	.....	.....	128.9	232.3	19.57

*Thus in the manuscript.

REMARKS.—The barometer is 1,169 meters above sea level. Readings are corrected for gravity, temperature, and instrumental error. The dry and wet bulb thermometers are 1.5 meters above ground and corrected for instrumental errors. The hourly readings for pressure, wet and dry bulb thermometers, are obtained by means of Richard registering instruments, checked by direct observations every three hours from 7 a. m. to 10 p. m. The hourly rainfall is as given by Hottinger's self-register, checked once a day. The standard rain gage is 1.5 meters above ground. In the Costa Rican system the San Jose local time is used, which is 0h 36m 13.3s slower than seventy-fifth meridian time.

TABLE 2.

Time.	Sunshine.		Cloudiness observed, 1901.	Temperature of the soil at depth of—				
	Observed, 1901.	Normal, 1889-1900.		0.15 *m.*	0.30 *m.*	0.60 *m.*	1.30 *m.*	3.00 *m.*
	Hours.	*Hours.*	%	° *C.*	° *C.*	° *C.*	° *C.*	° *C.*
7 a. m.	13.58	12.61	50	22.40	22.74	23.00	21.94	21.67
8 a. m.	23.90	19.43						
9 a. m.	26.84	21.07						
10 a. m.	24.60	21.53	50	23.04	22.90	23.04	21.97	.....
11 a. m.	23.59	19.91						
12 m.	21.04	16.85						
1 p. m.	15.54	15.37	70	23.83	23.27	22.75	21.97	.....
2 p. m.	14.55	14.21						
3 p. m.	9.02	10.72						
4 p. m.	4.75	7.01	90	23.77	23.30	22.72	21.92	.....
5 p. m.	3.09	4.77						
6 p. m.	0.42	2.01						
7 p. m.	.....	.....	70	23.51	23.24	23.02	21.92	.....
8 p. m.	.....	.....						
9 p. m.	.....	.....						
10 p. m.	.....	.....	50	23.23	23.15	23.01	21.92	.....
11 p. m.	.....	.....						
Midnight	.....	.....						
Mean	.....	.....	60	23.30	23.27	22.94	21.95	21.67
Total	180.92	165.28	.....	.....	.....	.....	.....	.....

Notes on the weather.—Up to the 17th the weather was dry, very hot, with daily threats of rain from the northeast in the afternoon. The 18th was the first day of real invierno or rainy season, but even afterwards there were dry and close days, quite unusual at this time of the year. In the surroundings of San Jose, coffee began again flowering after the first rainshower of the 18th, this being the latest flowering noted since 1888. On the Atlantic slope, the drought was very unusual and very marked on the coast belt.

Notes on earthquakes.—May 4, 5h 20m p. m., slight tremor. May 5, 4h 31m a. m., very light shock.

Evaporation.—During the daytime, 81.9; during the nighttime, 19.5.

TABLE 3.—*Rainfall at stations in Costa Rica*, 1901.

Stations.	January.		February.		March.		April.		May.	
	Amount.	No. rainy days.	Amount.	No. rainy days.	Amount.	No. rainy days.	Amount.	No. rainy days.	Amount.	No. rainy days.
	Mm.		*Mm.*		*Mm.*		*Mm.*		*Mm.*	
1. Boca Banano	265	17	98	11	278	14	219	16	92	8
2. Limon	304	19	72	9	214	15	193	12	96	7
3. Swamp Mouth	.....	.....	131	10	241	13	302	11	.....	.....
4. Zent	.....	.....	.....	.....	.....	.....	246	14	30	7
5. Gute Hoffnung	411	15	106	14	224	12	235	11	74	8
6. Siquirres	406	10	45	4	160	8	.....	.....	54	7
7. Guapiles	340	13	114	8	.....	.....	221	7	159	7
8. Sarapiqui	.....	.....	.....	.....	.....	.....	243	19	164	19
9. San Carlos	301	19	67	14	96	13	110	13	92	9
10. Las Lomas	521	16	131	10	181	14	66	4	123	4
11. Peralta	335	11	65	4	190	13	150	9	152	11
12. Turrialba	.....	.....	.....	.....	.....	.....	85	10	51	9
13. Juan Vinas	159	14	40	10	12	6	50	8	34	5
14. Santiago	.....	.....	.....	.....	.....	.....	66	9	34	11
15. Paraiso	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
16. San Rafael C	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
17. Tres Rios	2	1	5	1	0	0	2	1	92	12
18. S. Francisco G	.....	.....	.....	.....	.....	.....	.....	.....	187	12
19. San Jose	7	2	9	1	36	1	1	1	129	10
20. La Verbena	4	2	9	1	24	1	1	1	45	12
21. Alajuela	.....	.....	5	2	6	2	1	1	381	17
22. San Isidro Alajuela	0	0	1	1	.....	.....	8	1	311	24
23. Nuestro Amo	.....	.....	11	2	50	3	0	0	310	20
24. Sipurio	.....	.....	.....	.....	149	12	229	13	102	13

MONTHLY STATEMENT OF AVERAGE WEATHER CONDITIONS FOR MAY.

By Prof. E. B. GARRIOTT.

The following statements are based on average weather conditions for May, as determined by long series of observations. As the weather of any given May does not conform strictly to the average conditions, the statements can not be considered as forecasts.

Along the steamer routes of the North Atlantic Ocean severe storms are less frequent than during April. The average southern limit of arctic ice near Newfoundland and the Grand Banks extends southward to about the forty-first parallel. May is one of the months of greatest fog frequency from the Banks of Newfoundland to the United States coast.

The wet season in the West Indies and the typhoon season in the Philippine Islands begin in May.

In the Pacific coast districts of the United States the wet season is nearing its end. In the middle and northern Plateau regions there is a slight increase in the amount of rainfall as compared with April. In Arizona May is one of the driest months of the year. From the Rocky Mountains to the Mississippi River there is a general increase in rainfall leading to the June maximum. East of the Mississippi River May is usually a month of frequent rains, and in the middle and southern districts of the country, from the Rocky Moun-

tains to the Atlantic coast, severe thunderstorms are not uncommon. On the Great Lakes the severer storms of May advance from the middle-eastern slope of the Rocky Mountains. These storms average about two a month, and their approach is indicated by rapidly falling barometer and east to southeast winds. After the passage of the center of a storm the wind shifts to northwest with rising barometer.

In May the regions in which agricultural products are subject to damage by frost are usually confined to the extreme upper Missouri, and Red River of the North valleys, and the Rocky Mountain and Plateau regions from central New Mexico and the Texas panhandle northward.

SOME CAUSES OF THE VARIABILITY OF EARTHSHINE.

By H. H. KIMBALL.

(Read before the Astronomical and Physical Society of Toronto, June, 1901.)

When we observe the new moon shortly after sunset we are generally able to distinguish the outline of the whole moon, and the dark part is usually of a delicate green tint, or copper color. At the hour of sunset the sun is shining upon the half of the world that is west of us, while the eastern half is shrouded in darkness and night. Between us and the sun in the west is the moon, whose western half is illumined by the sun, but whose eastern half receives no direct sunlight, and is in darkness like the earth, except that its dark half may receive considerable light from the bright half of the earth. This so-called earthshine may vary considerably with the condition of the earth's surface and atmosphere. When the bright half of the earth is covered with snow or cloud it undoubtedly reflects more sunlight than a continent of forest and vegetation, and much more than an ocean of water, and on such occasions the dark half of the moon might be expected to be unusually bright. It is not often that we are able to collect data as to the condition of the atmosphere or of the earth's surface sufficient to satisfactorily explain the variations in the brightness of the dark side of the old moon when seen in the arms of the new.

Mr. G. E. Lumsden, President of the Toronto Astronomical and Physical Society, has requested any information that may be obtainable relative to the condition of the bright half of the earth at 6 or 7 p. m., eastern time, March 22, 1901, which corresponds to 11 p. m. or midnight, Greenwich time, or noon in the middle of the Pacific Ocean. By means of the data given in the Nautical Almanac we ascertain that at Greenwich midnight the sun was in the zenith at about longitude 180°, latitude 0° 40′ north, and the moon was in the zenith at about longitude 132° west, latitude 15° 7′ north. We have therefore prepared, in Chart X, an orthographic projection of the western half of the earth upon the horizon of a point whose zenith is about midway between the sun and moon at this time, namely, latitude 10° north, longitude 160° west. It would have been more correct to have made the projection with the moon in the zenith, but the results would not have differed appreciably from those here given.

Mr. Lumsden writes as follows:

> On the night of the 22d of March the moon, owing to earthshine, was so bright that a member of the Astronomical Society called me up by telephone, and asked me to make observations with the naked eye and an opera glass, with a view to comparison on other occasions. Indeed, I and other members who took the matter up in the course of the evening were surprised at the brilliant illumination, which enabled us to identify, even with the naked eye, certain well known lunar formations. On thinking the matter over, it occurred to me that this brilliancy might have been due to reflection from a very large area of clouded surface, which possibly at the time was true of the western American Continent and the Pacific Ocean, inasmuch as, shortly after midnight, the weather changed, and was succeeded by cloudy skies which lasted for some little time.

Referring to Chart X, and having in mind the positions of the sun and moon at the time specified above, we see that the sun illuminated the half of the globe from longitude 90° west, across the Pacific to 90° east, while the moon could only receive light from the earth's equatorial region as far west as longitude 138° east. Furthermore, while the sun illumined the earth practically from pole to pole, the moon received no light from the antartic regions beyond latitude 75° south. The illumined portion of the earth from which the moon received light, may therefore roughly be stated to lie between latitude 75° south and the North Pole, and longitudes 90° west and 138° east; and Chart X shows that it embraces practically the whole of the Pacific Ocean, the eastern portions of Australia, Japan, and Siberia, and the larger portion of North America—an area that does not differ sensibly, in character or extent, from the normal reflecting surface when the moon is two or three days old, and observed at about 7 p. m. from Toronto.

According to Bond,[1] the quantity of light received at any point by reflection from a surface may be represented by the equation

$$(1) \qquad di' = \theta \frac{\mu i}{4\pi} \frac{dp'}{\Delta^2},$$

in which di' may represent the quantity of light received by reflection from the earth upon an element of the moon's surface, ds', projected as dp' upon a plane perpendicular to a line joining the earth and moon; Δ the distance between the earth and moon; μ the albedo of the earth's surface; i the amount of light received by the earth from the sun, which we may assume to be a constant; θ a coefficient that varies with the reflecting properties of the reflecting surface. The value of θ is 1 for a polished sphere, 2 for a flat opaque disc reflecting equally in all directions on the side of the hemisphere toward which it is exposed, 4 for a flat disc in which the quantity of light reflected to any point is proportional to the apparent area of the disc as seen from that point, etc., assuming that the incident rays are parallel and perpendicular. For any given surface, however, this coefficient may be considered a constant, and its exact value does not concern us in the present investigation, since we have to do only with the variables of the above equation. We therefore obtain from equation (1) for the total light received at the moon by reflection from the earth the following expression, in which C is a constant:

$$(2) \qquad i' = C \frac{\mu}{\Delta^2}$$

Similarly, for the light reflected back from the moon to a point on the earth, by substituting (2) for i in (1), we obtain the following equation:

$$(3) \qquad di'' = \theta' C \frac{\mu}{\Delta^2} \frac{dp'' \mu'}{4\pi \Delta^2},$$

in which di'' represents the quantity of light received upon an element of the surface of the earth, projected as dp'' upon a surface perpendicular to a line connecting the earth and moon; θ' is a constant, as in equation (1), and μ' is the albedo for the moon. This albedo must also be a constant, since in the absence of an atmosphere we can not conceive of any variation in the reflecting power of the moon's surface, except the inappreciable variation due to the fact that by reason of libration a slightly different hemisphere is presented to us from time to time.

Our final equation for the quantity of earthshine observed on the moon from a point on the earth will therefore have the following form:

[1] George P. Bond, On the light of the moon and of the planet Jupiter. Memoirs American Academy of Arts and Sciences. 1861. Vol. VIII, p. 233.

(4) $$i'' = C' \frac{\mu}{\Delta^4},$$

in which C' is a constant, and the μ and Δ are variables.

We will now consider the probability of a variation in the value of μ, and its effect upon the intensity of the earthshine on March 22.

Referring again to Chart X, we estimate that the illumined disc of the earth, as seen from the moon, consisted of 15 per cent continent and 85 per cent ocean. The normal distribution of clouds is approximately shown by the lines on Chart X, which are based on the well known cloud charts of Teisserenc de Bort. These show that for the hemisphere we are considering, under average conditions for March, four-tenths of the ground is covered with cloud, and probably two-thirds of the remainder with snow. Over the ocean the average cloudiness is about six-tenths.

The albedos of these various surfaces are not so well determined as we could wish. Bond, in the memoir already quoted, records comparisons between the light reflected from various surfaces, determined principally by means of comparisons with Jupiter. He found, as did Herschel,[2] that the albedo of dry earth, or a rock surface, is about one-sixth that of white paper, or only a little less than that of the moon.

His value for white paper is only 0.410, and is apparently the same as the value determined by Lambert;[3] and his value for newly fallen snow is a little less than that for white paper.

Zöllner,[4] from direct measurements, has given a more satisfactory determination of the albedos of various surfaces, as follows:

Fresh fallen snow, 0.783; white paper, 0.700; white sandstone, 0.237; clay marl, 0.156; moist earth, 0.079; water, 0.021.

These results were obtained with an angle of incidence of 20°. The values vary somewhat with this angle, particularly for a water surface, for which Tyndall[5] gives the following:

Angle of incidence.	μ
°	
0	0.018
40	0.022
60	0.065
80	0.333
89.5	0.721

In the present case we need not concern ourselves about an angle of incidence greater than 20°, except in the case of a tempestuous sea, when the value of μ might greatly exceed that here given, and for cloud surface we may assume μ to have the same value as for white paper. Zöllner's value of the albedo of the moon is 0.1736, which would make that of an ordinary ground surface about 0.16. For a snow surface we can hardly adopt the value he has given, since over North America and Siberia, where the snow surfaces we are considering were lying, the reflecting power must have been much diminished by the presence of forests and bare ground. Furthermore, the surface of the fresh fallen snow soon loses its whiteness from a variety of causes. It will therefore be safer to adopt for the albedo of a snow-clad continent the mean between the albedos of the naked ground and snow, or $\frac{.78 + .16}{2} = 0.47$.

We may therefore deduce the normal average reflecting power of this hemisphere for March, as in the following table:

Proportional parts.			Albedos.	Reflecting power.
Continents... 15	Clouds....	6	0.70	4.20
	Snow.....	6	0.47	2.82
	Ground . .	3	0.16	0.48
Ocean..... 85	Clouds	51	0.70	35.70
	Water.....	34	0.021	0.71
Totals.... 100		100		43.91

or an average albedo of 0.44 for the illuminated hemisphere.

The log books of westward bound steamers on the Pacific Ocean on March 22, 1901, are not yet available to any extent, but through the courtesy of the Chief Hydrographer, U. S. N., we have been permitted to examine those of steamers eastward bound and find no evidence of any marked storms or unusual cloudiness over the water at that time. The average cloudiness at Greenwich midnight on March 22, as indicated by these log books, is shown by figures inclosed in circles on Chart X; the figures to the right and a little above the circle indicate the number of observations available for determining these averages. There was, however, an extended area of cloudiness over the western part of the United States, and snow had fallen there during the day. We may therefore increase the cloudiness over the land to seven-tenths and diminish the naked ground to two-tenths, thereby increasing the total in the above table to 44.45, or a little more than one per cent of itself, which would be inappreciable.

It will be interesting to note what would be the effect if the cloudiness over the ocean should be increased materially. We will suppose it to average seven-tenths, and in this case our results will be as follows:

Proportional parts.			Albedos.	Reflecting power.
Continents .. 15	Clouds...	7	0.70	4.90
	Snow....	6	0.47	2.82
	Ground..	2	0.16	0.32
Ocean 85	Clouds...	59.5	0.70	41.65
	Water...	25.5	0.021	0.54
Totals.....100		100.0		50.23

The total reflection in this case is nearly 15 per cent in excess of the average, but we have no data that justifies the assumption of any such increase in the cloudiness on March 22.

It now remains to investigate the effect of the variation in Δ, or the distance between the earth and the moon. The mean distance is about 239,000 miles; the distance at perigee is about 221,000 miles, and at apogee about 253,000 miles. Equation (4) shows us that the intensity of earthshine must vary inversely as the fourth power of these distances, or as 2385 to 3263 for the moon at mean distance and at perigee, and as 4097 to 3263 for the moon at mean distance and at apogee. In other words, the earthshine on the moon is 27 per cent brighter with the moon at perigee than it is with the moon at mean distance, and 25 per cent brighter with the moon at mean distance than it is with the moon at apogee. There is therefore an extreme variation in the intensity of earthshine of 52 per cent, due to the eccentricity of the moon's orbit. This is certainly a greater variation than we could expect from any probable increase or diminution in the average cloudiness over the hemisphere of the earth reflecting light to the moon.

From the Nautical Almanac we find that the semidiameter of the moon at Greenwich midnight, March 8, 1901, was 14′ 15.5″; at noon, March 21, it was 16′ 41.9″; and at midnight, March 22, 16′ 35.7″. On this latter date the moon was therefore just past perigee, and the earthshine should have appeared at least one-fourth brighter than the average.

[2] See pages 276 and 282 of Bond's memoir, above quoted.
[3] See page 282 of Bond's memoir, above quoted.
[4] Dr. J. C. F. Zöllner, Photometrische Untersuchungen. Leipzig, 1865.
[5] Prof. John Tyndall. Six Lectures on Light. London, 1873. Page 17.

The local conditions of the atmosphere have a noticeable effect upon the brightness of the celestial bodies, particularly when they are near the horizon, but apparently only average conditions prevailed at Toronto on the evening of March 22. The air over the United States and Canada had just been cleared of dust by a passing snow and rain storm, but there must have been considerable water vapor present, since the weather became cloudy shortly after midnight, as stated by Mr. Lumsden.

In conclusion, while it is possible that an increase in the cloudiness over the Pacific Ocean may have slighty increased the earthshine on the night in question, we may safely attribute the increased brightness observed to the comparative nearness of the moon at the time.

The new moon will not again be favorably situated for bright earthshine until April, 1902.

Since writing the above article, I find that in the Annals of Harvard College Observatory, Vol. XVIII, p. 75, in an article on the "Total eclipse of the moon, January 28, 1888," Prof. E. C. Pickering has computed the actinic albedo of the moon by the following process, as an illustration of a method that he proposed to apply more completely hereafter:

Two photographs were taken on February 18, 1888, giving for the region of Oceanus Procellarum 0.000015 units or 15 micro-units, if we may use the term. (The unit of light employed is that given out by a Carcel lamp burning pure colza oil and shining through a hole of 1 millimeter radius at the distance of 1 meter for 1 second.) This is equal to 0.000013 times the brightness of the same region during full moon when it is similarly illuminated by the sun. The relative brightness then of the sun and of the gibbous earth one day after it is on the quarter is as 1,000,000 to 13. Adopting Lambert's formula for the illumination of a smooth sphere $L = 1/\pi\,(\sin v - v\cos v)$ where v is the phase angle, we have for the date in question $v = 101°\ 15'$, whence $L = 0.422''$. [This, therefore, is the relative brightness of the moon for this phase angle regarding the brightness of the earth as unity when it is in opposition; a different result would have been obtained if Professor Pickering had used Zöllner's modification of Lambert's formula.]

From the above it follows that the brightness of the sun is to that of the full earth, as seen from the moon (on February 18, 1888), as 1,000,000 is to 31. The brightness of the sun has been variously estimated visually at from 350,000 to 600,000 times that of the full moon. A photographic determination of mine (Science, VI, p. 133) gave the value as 760,000 or in the ratio of 1.31 to 1,000,000. Adopting the latter figure, we find the full earth 23.6 times as bright, photographically, as the full moon. But the area of the earth is 13.5 times that of the moon, hence its albedo is 1.7 times as great. The portion of the earth illuminating the moon at the time consisted almost exclusively of that portion of the Pacific Ocean east of 160° east longitude, which is generally represented as occupying the Western Hemisphere. As the time of the observations was an afternoon of the rainy season in the South Pacific, it is presumable that a large amount of cloud occupied the visible portion of the torrid zone, while the extreme northern and southern regions were encased in snow and ice; it is therefore not surprising that the factor obtained is so large.

Professor Pickering's actinic albedo for February 18, 1888, when the moon is one day past its quarter, is not essentially opposed to my normal average albedo for March and for the moon three days before the quarter.

HAWAIIAN CLIMATOLOGICAL DATA FOR APRIL AND MAY, 1901.[1]

By CURTIS J. LYONS, Territorial Meteorologist.

GENERAL NOTE.

The mean temperature at sea level was 74.8°, or 0.6° above normal; the highest, 84°, and the lowest, 64° (at sea level).

[1] Through the kindness of Mr. Curtis J. Lyons, a general statement of weather conditions on the Hawaiian Islands may be expected to be furnished regularly for the MONTHLY WEATHER REVIEW. His memorandum for the current month is contained in the following lines.

The rainfall data for the Hawaiian Islands is published quite fully in the Honolulu newspapers in a form that will lead to interesting comparisons between the departures from normal in those islands and the departures in other parts of the world. We reprint the data for April and May, 1901, in conjunction with the annual rainfall for 1900, and hope to give similar tables in the future.—ED.

Rainfall data for the Hawaiian Service.

Stations.	Elevation.	Rainfall. Annual. Normal.	Rainfall. Annual. 1900.	Rainfall. April, 1901.	Rainfall. May, 1901.
HAWAII.					
HILO.	*Feet.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*
Waiakea	50	138.00	111.08	12.85	3.53
Hilo (town)	100	140.00	117.43	12.28	3.10
Kaumana	1,250	.....	.....	17.31	.....
Pepeekeo	100	134.80	87.15	8.94	2.16
Hakalau	200	115.00	102.05	6.48	1.51
Honohina	.....	120.00	113.13	8.47	1.56
Laupahoehoe	500	130.00	.....	6.16	1.01
Ookala	400	105.00	84.42	.....	0.55
HAMAKUA.					
Kukalau	250	75.00	72.24	2.88	0.29
Paauilo	750	75.00	90.79	4.31	0.14
Paauhau (Moore, Gibb)	300	65.00	49.80	.....	0.76
Paauhau (Greig)	1,150	84.00	67.80	2.24	0.17
Honokaa (Muir)	425	76.00	58.08	2.78	0.47
Honokaa (Rickard)	1,900	.....	74.25	.....	.....
Kukuinaele	700	64.00	62.95	2.18	0.40
KOHOLA.					
Awini Ranch	1,100	.....	73.65	4.95	.....
Niulii	200	51.00	46.36	6.62	0.07
Kohala (Mission)	585	55.00	45.28	3.59	0.44
Kohala (Sugar Co.)	234	55.00	47.32	5.04	.....
Waimea	2,720	38.40	37.74	3.82	1.41
Hawi Mill	600	.....	40.55	4.51	.....
Hawi Mill	300	.....	.....	4.02	.....
KONA.					
Kailua	950	53.30	56.23	10.23	.....
Kealakekua	1,580	61.00	64.65	8.86	12.67
KAU.					
Naalehu	650	.....	.....	3.23	4.79
Honuapo	15	.....	25.32	1.92	3.16
Hilea	310	34.00	29.00	3.10	3.10
Pahala	850	42.70	34.76	3.73	3.64
Moaula	1,700	.....	.....	3.10	.....
PUNA.					
Volcano House	4,000	.....	63.38	6.78	3.78
Kapoho	110	80.00	80.44	6.12	3.41
Pohoiki	10	81.70	75.10	.....	.....
Kalapana	8	.....	55.06	5.04	3.23
MAUI.					
Olowalu	15	.....	18.48	.....	.....
Waiopae Ranch	700	.....	.....	2.65	5.52
Kaupo (Mokulau)	385	.....	82.34	8.34	8.79
Kahikinui	1,550	.....	.....	.....	7.08
Kipahullai	300	.....	.....	14.21	4.93
Namoa Plantation	60	70.00	51.23	2.22	1.98
Nahiku	900	.....	.....	10.78	3.32
Nahiku	120	.....	105.13	6.68	2.85
Ha'iku	700	.....	59.34	10.78	0.80
Kula (Erehwon)	4,500	.....	.....	1.24	3.10
Puuomalei	1,400	55.00	71.99	2.51	0.78
Paia	180	.....	43.97	.....	.....
Haleakala Ranch	2,000	34.80	54.77	1.10	1.09
LANAI.					
Keomoku	6	.....	21.00	0.63	1.16
OAHU.					
Punahou (Weather Bureau)	50	38.40	37.25	3.11	3.23
Kulaokahua	50	30.30	33.21	2.15	2.45
Kewalo (King street)	15	31.40	29.85	2.20	2.67
United states Naval Station	6	.....	.....	0.66	1.41
Kapiolani Park	10	27.10	17.85	0.95	.....
Manoa (Woodlawn D)	285	.....	102.58	6.49	7.68
Maakiki Reservoir	.....	.....	.....	3.31	.....
School Street (B shop)	50	40.60	46.25	3.28	3.25
Insane Asylum	30	41.20	33.55	3.41	2.45
Nuuanu (W. W. Hall)	50	40.00	43.95	3.29	.....
Nuuanu (Wyllie Street)	250	63.40	69.49	6.15	3.58
Nuuanu (Elec. Station)	450	81.80	.....	5.37	.....
Nuuanu (Luakaha)	850	132.50	129.21	11.40	13.57
Waimamalo	25	38.90	46.68	2.41	5.30
Maunawili	300	75.20	79.20	8.99	11.59
Kaneohe	100	41.10	64.21	3.49	10.01
Ahuimanu	350	75.20	97.41	.....	.....
Kahuku	25	32.10	37.21	3.89	3.64
Waialua	20	.....	.....	2.25	3.19
Wahiawa	800	.....	.....	3.08	3.14
Ewa Plantation	60	22.77	15.39	2.82	2.36
Waipahu	200	.....	.....	0.71	3.08
Makiki Reservoir	150	.....	.....	.....	3.43
Kalihi-uka	250	.....	.....	.....	4.33
Moanalua	15	.....	.....	1.94	2.46
KAUAI.					
Lihue (Grove Farm)	200	42.30	30.86	3.13	3.56
Lihue (Molokoa)	300	48.80	37.20	3.54	9.75
Lihue (Kukaua)	1,000	.....	64.45	6.00	17.02
Kealia	15	.....	22.32	2.41	7.80
Koloa	250	.....	.....	2.00	.....
Kilauea	325	76.60	56.88	9.04	7.84
Hanalei	10	93.00	83.98	4.74	6.50
Waiawa	32	.....	.....	0.20	5.18
Wahiawa, Mount	2,100	.....	.....	11.20	28.75
Eleele	200	.....	.....	0.64	3.96

The precipitation on the island of Oahu was about normal for most sections, 3.23 inches at Honolulu, 13.57 inches at Luakaha, near the "Pali." The humidity was the highest average for May in twelve years. On the island of Hawaii, the sugar districts of the northeast coast, Hilo, Hamakua,

and Kohala, had only from 5 to 50 per cent of the normal rainfall; southeast and southwest exposures on the same island had from 200 to 400 per cent of normal; the same excess occurred on Kauai Island, and the same abnormal distribution on Maui Island. Extremes of precipitation, 0.07 at Niulii, north Kohala, and 28.75 at Wahiawi, Mount Kauai. There was an unusual excess of southerly airs and lack of trade wind, which accounts for the abnormal distribution of rainfall.

Meteorological Observations at Honolulu, May, 1901.

The station is at 21° 18′ N., 157° 50′ W.

Hawaiian standard time is 10h 30m slow of Greenwich time. Honolulu local mean time is 10h 31m slow of Greenwich.

Pressure is corrected for temperature and reduced to sea level, and the gravity correction, —0.06, has been applied.

The average direction and force of the wind and the average cloudiness for the whole day are given unless they have varied more than usual, in which case the extremes are given. The scale of wind force is 0 to 12, or Beaufort scale. Two directions of wind, or values of wind force, or amounts of cloudiness, connected by a dash, indicate change from one to the other.

The rainfall for twenty-four hours is measured at 9 a. m. local, or 7.31 p. m. Greenwich time, on the respective dates.

The rain gage, 8 inches in diameter, is 1 foot above ground. Thermometer, 9 feet above ground. Ground is 43 feet, and the barometer 50 feet above sea level.

Date.	Pressure at sea level.	Temperature.		During twenty-four hours preceding 1 p. m. Greenwich time, or 2:30 a. m. Honolulu time.									Total rainfall at 9 a. m., local time.
				Temperature.		Moisture.		Wind.		Average cloudiness.	Sea-level pressures.		
		Dry bulb.	Wet bulb.	Maximum.	Minimum.	Dew-point.	Relative humidity.	Prevailing direction.	Force.		Maximum.	Minimum.	
	*	†	†			‡	‡		§				
1	30.00	67	66	84	67	66.0	81	s-n.	1-0	6	30.06	29.97	0.08
2	29.98	69	67.7	81	66	67.7	81	sw-n.	1	6	30.06	29.97	0.02
3	29.95	70	69.3	81	67	68.3	83	se-n.	1	5	30.02	29.94	0.03
4	29.96	71	69.7	81	70	69.5	85	se-sw.	1	6	30.00	29.91	0.06
5	30.05	70	68	81	68	69.3	85	sw.	1	6	30.06	29.95	0.05
6	30.05	68	67.3	81	67	68.7	88	s-n.	1-0	9-10	30.08	30.04	1.03
7	29.99	67	66.3	81	67	69.0	85	e.	1-0	6	30.06	29.99	0.30
8	29.91	67	66.3	81	66	67.7	85	se.	1-0	6	30.02	29.92	0.07
9	29.90	66	65.3	79	66	67.5	86	se.	1-0	6-0	29.94	29.89	0.45
10	29.95	67	65.7	82	64	68.7	87	sw.	1-0	0-8	29.97	29.89	0.00
11	30.02	68	67	84	65	66.5	76	nne.	1	1	30.05	29.94	0.00
12	30.06	70	68	84	67	66.3	73	nne.	2	1-0	29.11	29.99	0.00
13	30.02	73	68.5	84	68	67.5	75	ne.	2	2	30.09	30.02	0.00
14	29.95	73	68.5	83	70	66.7	74	ne.	2	3-0	30.06	29.96	0.00
15	29.96	69	67	83	68	66.5	72	ne.	3-0	4-1	30.01	29.92	0.00
16	29.99	73	69.5	83	67	66.0	71	ne.	3-1	3	30.07	29.96	0.00
17	29.98	75	68.5	82	73	67.5	73	ne.	3	5	30.07	30.00	0.07
18	29.98	76	69.5	82	74	66.3	69	ne.	3-5	4	30.06	30.00	0.01
19	29.94	76	70.5	83	74	67.3	70	ene.	4	4	30.00	29.95	0.05
20	29.92	74	69.5	83	72	67.0	69	ne.	3-4	2-6	29.96	29.90	0.00
21	29.96	69	67.7	84	74	67.7	72	ne.	3	3	29.98	29.93	0.00
22	29.95	69	67	83	69	68.7	80	se-n.	2	3-8	30.02	29.95	0.10
23	29.88	73	68	82	68	67.0	76	nne.	3	3	29.96	29.88	0.00
24	29.94	74	68	84	67	67.7	76	se-nne.	2-0	3-7	29.96	29.86	0.09
25	29.98	73	68	83	67	65.3	68	ene.	2-0	5	30.02	29.94	0.07
26	30.00	75	68.5	84	67	65.7	67	se-ne.	2-4	3	30.05	29.99	0.00
27	29.98	74	68.5	83	74	65.5	64	ene.	4-2	4	30.08	29.99	0.01
28	29.92	71	69	84	72	66.7	70	ene.	3-0	4	30.00	29.92	0.09
29	29.88	71	70	81	70	68.5	82	esw.	1-0	8-3	29.95	29.88	0.37
30	29.91	72	70 7	81	69	70.3	84	ssw.	1-3	7	29.95	29.86	0.06
31	29.95	71	68.5	81	70	70.7	83	ssw.	1-0	8-2	29.99	29.93	0.27
Sums..	.....	.....	.....	...	.....	.....	.....	.....	.....	.....	.....	.....	3.23
Means.	29.965	71.1	67.6	82.3	68.8	77.0	77.1	.....	1.7	4.0	30.022	29.943	.....
Departure..	—.042	.....	+3.7	.....	.....	+6.7	.....	.....	.....	—0.4	.....	.....	.....

Mean temperature for May, 1901 (6 + 2 + 9) ÷ 3 = 74.8; normal is 74.2. Mean pressure for May, 1901 (9 + 3) ÷ 2 = 29.979; normal is 30.021.

*This pressure is as recorded at 1 p. m., Greenwich time. †These temperatures are observed at 6 a. m., local, or 4:31 p. m., Greenwich time. ‡These values are the means of (6 + 9 + 2 + 9) ÷ 4. §Beaufort scale.

SUMMARY OF METEOROLOGICAL RECORD FOR THE MONTH OF MAY, 1901, AT HONOLULU (PUNAHOU.)

Temperature: mean for the month, 74.8°; normal, 74.2°; average daily maximum, 82.3°; average daily minimum, 68.8°; average daily range, 13.5°; greatest daily range, 19°; least daily range, 8°; highest temperature, 84°; lowest, 64°.

Barometer: average, 29.979; normal, 30.021 (corrected for gravity by —.06); highest, 30.11; lowest, 29.86; greatest 24-hour change, 0.9. Lows passed this point on the 8th, 19th, 23d, and 29th; highs on the 5th, 11th, 17th, and 25th. There were no very marked changes in pressure.

Relative humidity: average, 79; normal, 70; mean dew point, 67.6; normal, 64; mean absolute moisture, 7.38 grains to the cubic foot; normal, 6.53. The humidity was considerably the highest of any month of May on record for twelve years.

Rainfall: 3.23 inches; normal, 3 inches; rain-record days, 20; normal, 19; greatest rainfall in one day, 1.03 on the 6th; total at Luakaha, 13.57; at Kapiolani Park, —. Total rainfall since January 1, 21.52; normal, 17.30.

The artesian well utilized for observation at Punahou is closed for repairs; consequently there is no record for this month.

Trade wind days: 16 (3 of north-northeast); normal number of trade wind days for May, 24; average force of wind, 1.7, Beaufort scale; cloudiness, tenths of sky, 4.0; normal, 4.4.

Approximate percentage of district rainfall as compared with normal: Hilo, 40 per cent; Hamakua, 12; Kohala, 12; Waimea, 66; Kona, 210; Kau, 200; Puna, 75; Maui, north exposures, 100 per cent, southeast exposures, 200; Oahu, normal, excepting Koolaupoko, 150; Kauai, 250 per cent, excepting Hanalei, north coast, 100. The cause of the abnormal distribution of rain was the excess of southeast wind above normal, causing precipitation on the corresponding exposed side of the higher islands.

Average temperatures: Pepeekeo, Hilo district, 100 feet elevation, average maximum, 78°; average minimum, 68°; Waimea, Hawaii, 2,730 feet elevation, 77° and 64.3°; Kohala, 521 feet elevation, 82.5° and 70.3°; Kulaokahua, W. R. Castle, Oahu, 60 feet elevation, highest, 86°; lowest, 67°.

No earthquake reported this month. Snow is still visible on the summit of Mauna Kea.

There was thunder at Honolulu on the 8th and 9th.

MEXICAN CLIMATOLOGICAL DATA.

Through the kind cooperation of Señor Manuel E. Pastrana, Director of the Central Meteorologic-Magnetic Observatory, the monthly summaries of Mexican data are now communicated in manuscript, in advance of their publication in the Boletin Mensual. An abstract, translated into English measures, is here given, in continuation of the similar tables published in the MONTHLY WEATHER REVIEW since 1896. The barometric means are now reduced to standard gravity.

Mexican data for May, 1901.

Stations.	Altitude.	Mean barometer.*	Temperature.			Relative humidity.	Precipitation.	Prevailing direction.	
			Max.	Min.	Mean.			Wind.	Cloud.
	Feet.	*Inch.*	° *F.*	° *F.*	° *F.*	%	*Inch.*		
Culiacan (Sin.)	112	29.67	95.0	67.8	80 1	49	0.29	sw.	.....
Leon (Guanajuato)	5,906	24.21	92.1	49.5	73.9	23	0.01	nw.	w.
Linares (Nuevo Leon)	1,188	28.50	100.4	60.8	78.6	75	4.25	s.	s.
Mazatlan	25	29.84	83.3	65.8	75.0	75	.....	nw.	w.
Mexico (Obs. Cent.)	7,472	22.97	86.7	47.8	67.1	49	0.63	se ,sw.	ne.
Morelia (Seminario)	6,401	23.89	85.3	50.5	68.7	55	0.70	sw.	w.
Puebla (Col. Cat.)	7,125	23.29	83.7	48.0	69.8	56	1.98	e.	wsw.
Saltillo (Col. S. Juan)	5,399	24 67	91.4	51.8	71.8	63	0.47	s.	s.
S. Isidro (Hac. de Gto)	.....	.....	82.4	65.8	.....	.....	0.08	w.	.....
San Luis Potosi	6,202	24.01	94.3	51.1	73.6	46	0.64	e.	w.
Toluca	8,812	21.91	80.6	39.2	60.8	48	1.73	w.	e.
Zapotlan (Seminario)	5,079	25.00	93.2	51.8	73.6	50	0.02	sse.	w.

*Reduced to standard temperature and gravity.

TWENTY YEARS' STUDY OF SNOW CRYSTALS.

By W A. BENTLEY, of Nashville, Vt., April 13, 1901.

During the winter of 1884 the writer secured his first microphotographs of snow crystals; previous to this he had made some 300 drawings but found these unsatisfactory.

Photographs have been secured during every winter since

1884 and they now number over 800, no two alike. Nearly every great and famous winter storm since that date has furnished its quota of from four to twenty (and in one instance thirty-four) of new forms to this collection. At the same time observations have been made and data secured, while photographing them, of the temperature; kinds and approximate heights of clouds (when possible); the direction and rapidity of movement of various cloud strata; the direction and velocity of the surface winds; also changes in the forms of the crystals from hour to hour as the different portions of each storm passed over our locality. The latter observations were made to ascertain whether there was any general law of distribution of the forms within the different portions of a storm. Differences in form of crystals deposited by local storms from those of general storms were also noted, as also the forms originating in, and peculiar to, each of the various cloud strata. These observations, and the data secured, indicate that the temperature and the humidity of the air at the earth's surface is a much less important factor than is generally supposed in determining the form and size of the crystals. We may easily conceive this to be the case, because at a given temperature, etc., at the earth's surface, the temperature and humidity of the air where the crystals form might vary greatly, one time from another, and would depend largely upon the height of the snow-producing clouds. The height of these varies greatly at different times, even when the temperature at the earth's surface remains the same. The data secured has not revealed the great mystery of the origin and cause of the differences in the forms of the nuclei; why columnar forms predominate at one time, tabular forms at another, or why both are sometimes found associated together. Much has been learned, however, of the conditions tending to modify their forms after the nuclear form is once organized. These conditions are many, the chief among them being the height, number, and vertical depth of the cloud strata and the resultant variation in temperature, atmospheric pressure, and humidity due to these; the character of the storm, whether local or general, and the portion of the storm region from which the crystals come. To these must also be added the initial and subsequent movement of the crystals within the clouds. If, as must often be the case, the nuclear forms originating in the lower ascending clouds are carried upward to much greater heights by the strong ascending air currents, which often occur within such storms, until they become heavy enough to fall back through them, then the crystals will in all probability be greatly modified by passing through atmospheric strata varying so greatly in density, temperature, humidity, etc. That they are greatly modified by these flights in the clouds is clearly shown by the interior structure of many of the crystals outlining many of these transitory states. Thus, crystals whose nuclear form was originally nearly perfectly hexagonal, sometimes become partly triangular in outline, and vice versa. No. 19 is an example of such modifications.

Nuclear imperfections are often corrected and crystals become perfect in form, as in No. 8. Conversely, perfect crystals become imperfect, as in No. 18.

Tabular outgrowths in rare instances take place around a prismatic crystal, while spinous outgrowths often occur from and on a perpendicular with the main axis of tabular crystals.

Crystallization sometimes goes on also around the parts of a broken crystal, as in the very interesting example, No. 23.

Small tabular hexagons often acquire branching additions around their angles in the lower clouds and become of large size, as in Nos. 16, 7, 8, 11, 15.

Again, perfect crystals often receive additions of granular material in the lower clouds.

Perhaps the most important facts of a general nature to be gleaned from our twenty years' study are these:

1. That the greater number of the more perfect and beautiful tabular forms occur much more frequently in and are confined almost wholly to the western and northwestern portions of great storms and blizzards.

3. That there seems to be a law of general distribution of the different forms, the columnar to one, the tabular and granular to others, with many varieties associated together in other portions of such great storms.

3. That this distribution is, with few exceptions, constant, that is, the same in nearly all storms.

Sufficient data has not as yet been collected to demonstrate beyond all doubt the fact that this law applies to all forms of crystals and to all storms alike.

Passing on to the variation in form of those crystals deposited by local storms, as compared with those of general storms, we find that these are very marked, except during intense cold.

The local storm types and those precipitated from low, detached clouds usually consist of large, frail, branching, tabular forms, devoid of a solid tabular nucleus (see No. 24), or of heavy granular varieties, similar one to the other, each according to its class. On the other hand, those deposited by general storms are usually more diversified in form and more complex in structure, the snowfall often consisting of two or more varieties associated together. The larger and more perfect columnar prisms (similar to No. 26), columnar forms possessing tabular outgrowths at one or both ends (which we might call doublets), truncated triangular forms (see Nos. 2 and 3), and solid tabular forms, the latter often possessing wonderfully beautiful and complex interior designs (as in Nos. 1, 2, 3, 4), are common only to general storms. Branching tabular and granular forms are common to both general and local storms, but they ordinarily possess solid nuclei if deposited from a general storm (as in Nos. 5 to 16), whereas the nuclei are generally absent (as in No. 24) if the crystals originated in local storms. During zero weather the crystals of local storms approach much nearer in form to those of general storms, and we find solid tabular forms, branching tabular forms possessing solid hexagonal nuclei and sometimes doublets, among the snowfall. Often during the intense cold succeeding a blizzard the snowfall will consist wholly of very minute columnar and pyramidal forms, like No. 25, or of both columnar and minute frost like tabular forms, falling apparently from low, detached nimbus or alto-nimbus clouds, or even from a sky free, or nearly so, of clouds.

During relatively mild temperatures each cloud stratum, if alone, there being no other clouds either above or below them, commonly precipitates each its own peculiar type of crystals. Low detached nimbus clouds deposit large, frail, branching tabular forms, similar to No. 24; intermediate clouds, smaller, branching tabular forms, possessing solid hexagonal nuclei; and the high cirro-stratus clouds, small compact columnar and tabular forms. The large cumulus clouds of spring and autumn usually shed large, heavy, pyramidal-shaped granular snow. These granular forms frequently, if not invariably, possess nuclei of branching, tabular forms, and are usually precipitated when the temperature is near or somewhat above the freezing point.

Consulting the microphotographs engraved for this article, we find that, with the exception of No. 24, all are those common to and were deposited by great storms. The beautiful set of six forms, Nos. 11 to 17, photographed during the afternoon of February 13, 1901, possesses great interest, because they demonstrate that crystals of large size are not rare even during extreme cold. The forms of that date were unusually large and thick, yet the temperature was uncommonly low, 3° F. below zero to 3° F. above. The clouds from which they separated consisted of a rather thin stratum of intermediate clouds, lying at an altitude somewhat above 5,000 feet. A

fresh west wind was blowing at this time, and clouds were drifting from west to east quite swiftly.

Further analysis of the forms of February 13 shows us that the crystals, while large and branching in outline, are not frail and ethereal like the branching forms common to mild temperatures. So broad are the secondary rays, it is obvious that a slight augmentation of growth would have filled in all the smaller interstices between the secondary and primary rays and greatly increased the dimensions of the solid nuclear portion. Further analysis reveals that the crystals have undergone a multitude of transformations, leaving the crystals full of interior details. This is a common characteristic of those produced during intense cold. By this we may conclude that during intense cold the outgrowths, while they may be many, are each of small extent.

Of the other numbers of the series, No. 2 is very rare and unusual, containing as it does eleven triangular divisions within its outlines. Apparently the lines of greatest growth were reversed during one stage of the growth of this strange form, thus differing widely from No. 3, whose outlines are somewhat similar. No. 6 possesses a very rare unique nuclear design which is very difficult to explain by any process of crystallization of which we know. No. 7 (a souvenir of the great blizzard of March 12, 1888) is very symmetrical, as also are Nos. 9 and 21, of February 15, 1901. No. 10 is, in all but the unimportant outermost points, a marvel of complexity and perfect symmetry. No. 20 is also a marvellously beautiful and symmetrical example of snow architecture. No. 22 is rare and unusual, a conundrum for the crystalographer.

Passing to the causes governing the formation of the nucleus, whether it be columnar or tabular, the electrified state of the atmosphere, whether negative or positive, and perhaps, also, as suggested by Prof. Cleveland Abbe, the presence in greater or less amounts of various gases and vapors in the atmosphere, may all be controlling factors.

The study of hoar frost crystals, which are also divisible like snow into two fundamental classes, columnar and tabular, may throw much light upon this obscure point. As already noted (see article on frost crystals in Popular Science, April, 1899), the two varieties of frost crystals do not usually coalesce in equal numbers; generally one or the other variety will greatly predominate and form the great mass of the crystals. Should it be found that one variety forms on nights when the air is negatively, and the others when it is positively, electrified, then we should be led to conclude that one is the negative and the other the positive form of crystal.

Although much has been already learned about these interesting phenomena, yet there still remains much more. Cooperation between many observers is essential to carry out this work successfully. Simultaneous observations of the forms and changes the crystals undergo from hour to hour during our great blizzards should be made by many skilled observers, stationed along a general line extending north and south. These observers must be familiar with the names and approximate heights of the various clouds. This study should include observations of the kind and approximate height and direction of drift of the various clouds, direction and force of the surface wind, temperature of the air, and amount of moisture at the earth's surface; also its electric condition, whether negative or positive, and the portion of the storm from which the crystals emanate.

It is also highly desirable that observations be made to ascertain why the perfect crystals are more common in the western portion of storms, and also why certain portions produce certain types.

Such a study, supplemented by investigations as to the causes of the formation of the two fundamental types of hoar frost crystals, would doubtless lead to the discovery of very many of the mysteries surrounding the origin and history of the wondrously beautiful forms of snow.

LIST OF MICROPHOTOGRAPHS ON PLATES I, II, AND III.

1. 1895, February 8. Wind northwest, temperature —4° F.
2. 1900, February 18. Wind west to northwest, temperature 11°.
3. 1899, February 13. Wind north, temperature 1°.
4. 1895, March 2. Wind northwest, temperature 16°. Cloud, cirro-stratus.
5. 1898, November 27. A great blizzard. Temperature 12°; size one-fifth of an inch.
6. 1900, December 5. Wind northwest to north. Temperature 22°. Cloud, stratus.
7. 1888, March 12. Great blizzard. Temperature 12°. Diameter one-quarter of an inch.
8. 1901, January 28. Wind changing from west to northwest. Temperature 11°.
9. 1901, February 15. Wind northwest. Temperature 14.
10. 1898, January 26. Wind changing west to northwest. Temperature 18°.
11. 1901, February 13.
12. 1901, February 13.
13. 1901, February 13.
14. 1901, February 13.
15. 1901, February 13. Temperature —2°. Diameter one-third of an inch.
16. 1901, February 13.
17. ——.
18. ——.
19. 1899, January 6. Wind south-southeast. Temperature 22°. Clouds, upper stratus.
20. 1886, February 26. Wind northwest. Temperature 8°.
21. 1901, February 15. Wind northwest. Temperature 13°.
22. 1900, December 27. Temperature 28°.
23. 1901, February 5. Temperature 18°.
24. ——. Wind west. Temperature 34°.
25. ——. Wind northwest. Temperature —11°. Thin, low clouds.
26. ——. Temperature 24°. Cirro-stratus clouds.

CLIMATOLOGICAL DATA FOR JAMAICA.

Through the kindness of Mr. Maxwell Hall, the following data are offered to the MONTHLY WEATHER REVIEW in advance of the publication of the regular monthly weather report for Jamaica:

Jamaica, W. I., climatological data, May, 1901.

	Negril Point Lighthouse.	Morant Point Lighthouse.
Latitude (north)	18° 16′	17° 56′
Longitude (west)	78° 23′	76° 10′
Elevation (feet)	33	8
Mean barometer 7 a. m.	29.904	29.902
Mean barometer 3 p. m.	29.856	29.853
Mean temperature 7 a. m	80.3	80.6
Mean temperature 3 p. m	84.3	86.0
Mean of maxima	86.6	.....
Mean of minima	74.3	.....
Highest maximum	89.1	.....
Lowest minimum	71.3	.....
Mean dew-point 7 a. m	72.1	.....
Mean dew-point 3 p. m	75.0	.....
Mean relative humidity 7 a. m.	74.5	.....
Mean relative humidity 3 p. m.	72.0	.....
Total rainfall (inches)	1.71	3.49
Average wind direction 7 a. m	e.	e.
Average wind direction 3 p. m	.....	se.
Average hourly velocity 7 a. m	6.7	6
Average hourly velocity 3 p m	13.5	9.2
Average cloudiness (tenths):		
7 a. m. Lower clouds	0.0	1.3
7 a. m. Middle clouds	2.4	2.1
7 a. m. Upper clouds	3.3	1.2
3 p. m. Lower clouds	0.3	1.7
3 p. m. Middle clouds	6.5	2.2
3 p. m. Upper clouds	1.1	1.3

NOTE.—The pressures are reduced to standard temperature and gravity, to the Kew standard, and to mean sea level. The thermometers are exposed in Stevenson screens.

Comparative table of rainfall for each geographical division.

Divisions.	Relative area.	Number of available averages.	Rainfall.	
			Average for May.	Current for May, 1901.
Northeastern division	25	18	12.58	5.46
Northern and sub-central division	32	50	7.57	5.00
Western-central division	36	27	14.02	10.06
Southern division	27	35	8.66	4.01
General means	...	...	10.71	6.13

Evidently the rainfall for May, like that for April, was seriously deficient.

In taking the average rainfall Mr. Hall uses only those stations for which he has several years of observation, so that the column of averages represents fairly well the normal rainfall for each division, while the column for the current month represents the average rainfall at those same stations. The relative areas of the division is very nearly the same and is given in the following table as expressed in percentages of the total area of Jamaica. The number of rainfall stations utilized in each area varies slightly from month to month, according as returns have come in promptly or not, but will not differ greatly from the numbers in the second column of the table.

RECENT PAPERS BEARING ON METEOROLOGY.

W. F. R. PHILLIPS, in charge of Library, etc.

The subjoined titles have been selected from the contents of the periodicals and serials recently received in the library of the Weather Bureau. The titles selected are of papers or other communications bearing on meteorology or cognate branches of science. This is not a complete index of the meteorological contents of all the journals from which it has been compiled; it shows only the articles that appear to the compiler likely to be of particular interest in connection with the work of the Weather Bureau:

Terrestrial Magnetism and Atmospheric Electricity. Baltimore. Vol. 6.
Exner, Franz. Summary of the results of Recent Investigations in Atmospheric Electricity. (Concluded.) P. 1.
Science. New York. N. S. Vol. 13.
—— Syntonic Wireless Telegraphy. P. 874.
American Journal of Science. New Haven. Vol. 11.
Langley, S. P. The New Spectrum. P. 403.
Annales de Géographie. Paris. 10me année.
Voeikov, A. De l'influence de l'homme sur la terre. (Second article.) P. 193.
Ciel et Terre. Bruxelles. 22me année.
Bieler, S. Influence du climat sur le développement des races bovines. Pp. 165–173.
Wolfer, A. Les centres principaux de l'activité solaire. P. 133.
L., v. D. A propos du tir contre la grêle. P. 140.
Scientific American. New York. Vol. 84.
—— Wireless Telegraphy for the Prevention of Shipping Disasters. P. 355.
—— A new Flying Machine. P. 357.
Scientific American Supplement. New York. Vol. 51.
Marconi, G. Syntonic Wireless Telegraphy. Pp. 21269 and 21291–21293.
Deutsche Mechaniker Zeitung. Berlin. 1901.
Wiebe, H. F. Bericht über die Thermometer und Barometer auf der Pariser Weltausstellung. P. 81.
Baumann, Th. Versuch, die Höhe der Atmosphäre auf geometrischem Wege zu finden. P. 96.
Zeitschrift für Instrumentenkunde. Berlin. Vol. 21.
Hecker, O. Untersuchung der Konstanz von Siedethermometern aus dem Glasse. Vol. 59. III. P. 133.
Nature. London. Vol. 64.
—— Climate and Time and Mars. Pp. 106–107.
Lockyer. Wm. J. S. A long Period Sunspot Variation. Pp. 196–197.
Shaw, W. N. Hailstorm Artillery. Pp. 159–161.
Philosophical Magazine. London. Vol. 1. *6th Series.*
Townsend, J. S. Conductivity produced in Hydrogen and Carbonic Acid Gas by the Motion of Negatively Charged Ions. Pp. 630–642.
Annuaire, Société Météorologique de France. Tours. 49me année.
Decheverens, M. Sur la cause des variations accidentelles de la température de l'air. Pp. 103–105.
Comptes Rendus. Paris. Tome 132.
Baume-Pluvinel, A. de la. Sur le spectre de la couronne solaire photographié à Elche (Espagne) pendant l'éclipse totale de Soleil du 28 mai 1900. Pp. 1259–1264.
Marey, —. Changements de direction et de vitesse d'un courant d'air qui rencontre des corps de formes diverses. Pp. 1291–1296.
Gonnessait, F. Six mois d'observations météorologiques à Quito. P. 1444.
Engineering News. New York. Vol. 45.
Brown, L. W. Protection of Cities in the Mississippi Valley against Encroachments of Rivers. Pp. 427–429.
La Nature. Paris. 29me année.
Jullien, O. Près du Mont-blanc; le climat de Bonneville et des environs. Pp. 26–27.
L'Aérophile. Paris. 9me Année.
Farman, M. 3,000 kilomètres en ballon. Pp. 109–119.
Himmel und Erde. Berlin. 13 Jahrg.
Boernstein, R. Das Wetterschiesen. Pp. 402–408.
Jachmann, —. Die Taifune in den ostasiatischen Gewässern. Pp. 419–424.
Popular Science Monthly. New York. Vol. 69.
Willis, Bailey. Climate and Carbonic Acid. Pp. 242–256.
Symons's Meteorological Magazine. London. Vol. 36.
—— International Investigation of the Sea and Air. Pp. 74–76.
—— Proposed Observations on Dew-Ponds. Pp. 76–77.
Mohn, H. The Norwegian Rainfall Service. Pp. 80–81.
Gaea. Leipzig. 37 Jahrg.
—— Die neueren Anschauungen über die Ursachen der Luftelektrizität. (Schluss). Pp. 406–410.
—— Uber Kugelblitze. Pp. 410–417.
—— Uber Polar-Forschungen. Pp. 417–420.
—— Die internationale Ballonfahrt am 19 April, 1901. Pp. 432–433.
Meteorologische Zeitschrift. Band 18. *Wien.*
Kremser, V. Neunte Allgemeine Versammlung der Deutschen Meteorologischen Gesellschaft zu Stuttgart am 1–3 April, 1901. Pp. 193–211.
Hann, J. Einige Ergebnisse der Temperaturbeobachtungen auf dem Strassburger Münsterthurm. Pp. 211–216.
Heintz, E. Ueber Niederschlagsschwankungen in den Fluss gebieten der Wolga, des Dnieper und des Don während der Periode 1861–1898. Pp. 216–223.
Maurer, J. Frank Very's Experimentaluntersuchung über die atmosphärische Strahlung. Pp. 223–230.
Prohaska, K. Rother Schnee, Schlammregen und Gewitter am 11 März 1901 in den österreichischen Alpenprovinzen. Pp. 231–234.
—— Staubfall in der Schweiz und Ober-Italien. P. 234.
Czermak, P. und Jesser. Staubfall in Tirol. P. 234.
—— Staubfall vom 6–7 März, 1893. P. 236.
—— Der letzte Blutregen. P. 236.
—— Der Blutregen in Sicilien. P. 237.
Hapke, L. Wüstenstaub in Bremen. P. 237.
—— Der Staubfall in Tunis. P. 238.
—— Berichtigung. P. 238.

NOTES BY THE EDITOR.

THE EFFECT OF THE MOON ON VEGETATION.

In a letter received some time since from the editor of the Rural New Yorker, Mr. H. W. Collingwood, he states that there has been quite a discussion lately as to whether there are any accurate experiments regarding the influence of the moon upon vegetation. He desires to know of any records of experiments on this point, and also any relative to the effect of the changes of the moon on the weather. "So many farmers insist that the moon changes their crops in one way

or the other that I would like if possible to show them that this is impossible."

The experiments above referred to belong to the agricultural experiment stations and not to the Weather Bureau, since the latter can only make observations on meteorological phenomena. The atmosphere is too large to permit of making experiments, properly so called, with it. The acting director of the office of experiment stations states that he "knows of no experiments bearing directly upon the question of the effect of the moon upon vegetation."

We have to do with a belief that has come down to us from prehistoric times, one that began before accurate observations were recorded, and that may have originated like the myths of mythology, like the practise of "medicine men" and "fakirs," like the Arabian Nights, or the tales of ghosts and banshees. The general growth of a myth is well illustrated in Fiske's Myths and Myth Makers.

We quote from a few of the proverbs relating to the influence of the moon upon vegetation, as handed down to us through folk-lore. In some communities these sayings still have an influence in the agricultural industries notwithstanding their apparent absurdity:

> Go plant the bean when the moon is light,
> And you will find that this is right;
> Plant the potatoes when the moon is dark,
> And to this line you will hark;
> But if you vary from this rule,
> You will find you are a fool;
> If you follow this rule to the end
> You will always have money to spend.
> *Dunwoody, Weather Proverbs, p. 59.*

Plant garden beans when the sign is in the scale they will hang full.—*Tusser, Five Hundred Points of Husbandry.*

> Sowe peason and beans in the wane of the moone,
> Who soweth them sooner, he soweth too soone;
> That they with the planet may rest and rise,
> And flourish with bearing most plentiful wise.
> *Werenfels, Dissertation upon Superstition (transl. Lond., 1748), p. 6.*

He (the farmer) will not commit his seed to the earth when the soil, but when the moon, requires it. He will have his hair cut when the moon is either in Leo, that his locks may stare like a lion's shag, or in Aries, that they may curl like a ram's horn. Whatever he would have to grow, he sets about it when she is on her increase, but what he would have made less, he chooses her wane.—*Werenfels, Dissertation upon Superstition (transl. Lond., 1748), p. 6.*

Seeds of all kinds should always be sown during the moon's increase, that is, between the time of new and full moon. Destroy weeds, dig, harrow, plow, and hoe from the full until the new, that is, during the moon's decrease. As the moon increases in light, the most suitable sign for germination has next been selected. The best spring signs are undoubtedly Taurus, Cancer, and Libra; the moon must therefore be in one of these, and it is also best that one of these be rising on the eastern horizon. Cancer and Libra are preferred to Taurus.—*Walter H. Smith, in Vennor's Almanac, 1884, p. 29.*

Here are three different sayings as to the phase of the moon during which to plant:

1, a bright moon for beans and a dark moon for potatoes; 2, an increasing moon for whatever we would have to grow well; 3, a waning moon for peas and beans. To add to our confusion, Mr. Smith, who is an advocate of the increasing moon theory, also tells us that we must wait until the moon is in a favorable sign of the zodiac, with another favorable sign rising in the east. He kindly came to the assistance of those who can not make the computations and selected, for the year 1884, the days and hours on which they might plant their seed. There were two favorable days in April, five in May, and three in June, and about three favorable hours on each day.

In spite of the fact that there are therefore only one or two full working days in a whole month when the moon and the signs are favorable for planting, our American farmers wisely busy themselves with seed sowing when the soil (not when the moon) allows it, and in good time they gather in the crop. Evidently the American farmers, as a class, doubt the influence of the moon, but do believe in the soil, temperature, rainfall, manure, and laborious cultivation.—*H. H. K.*

PUBLICATIONS OF THE UNITED STATES WEATHER BUREAU.

In a letter dated Vienna, April 30, 1901, Prof. Julius Hann suggests that it would be desirable if European meteorologists could be more easily informed as to what bulletins the Weather Bureau has published.

Since the organization of the Weather Bureau on a civilian basis under the Department of Agriculture on July 1, 1891, the bulletins have been designated by letters of the alphabet when in quarto form, and by numbers when in octavo form. The latest publications under these classifications are Bulletins H and No. 29, respectively. Since January, 1895, all the publications have been numbered chronologically in addition to their special serial designations; the latest publication, the current number of the MONTHLY WEATHER REVIEW, has the chronological number 246.

Dr. W. F. R. Phillips, in charge of the Weather Bureau Library, has prepared the following list of the bulletins and other more important publications of the Weather Bureau, exclusive of author's separates and periodic publications. It probably includes all of interest to scientists and the public generally. Hereafter a list of recent publications will appear monthly in the pages of the REVIEW.

Most of these publications may be purchased for a nominal sum, but they are generally intended for free distribution among the meteorologists and scientific libraries of this and other countries. Those marked with a star (*) are now out of print, but occasionally a copy is returned to the Bureau. Applications for publications should be addressed to "The Chief of the U. S. Weather Bureau."

LIST OF THE MORE IMPORTANT BULLETINS, AND OTHER PUBLICATIONS OF THE UNITED STATES WEATHER BUREAU.

Bulletin A. Summary of international meteorological observations. H. H. C. Dunwoody. (19 by 24 in.) 20 pp. 61 charts. 1893.

* Bulletin B. Surface currents of the Great Lakes, 1892–1894, inclusive. M. W. Harrington. (19 by 24 in.) 14 pp. 6 charts. 1894.

Bulletin C. Rainfall and snow of the United States. M. W. Harrington. 4to. 80 pp. Atlas (19 by 24 in). 23 charts. 1894.

Bulletin D. Rainfall of the United States. A. J. Henry. 4to. 58 pp. 11 charts. 1897.

Bulletin E. Floods in the Mississippi River. Park Morrill. 4to. 77 pp. 59 plates. 1897.

Bulletin F. Report on the kite observations of 1898. H. C. Frankenfield. 4to. 71 pp. 6 plates. 4 charts. 1899.

Bulletin G. Atmospheric radiation. F. W. Very. 4to. 130 pp. 1900.

Bulletin H. West Indian hurricanes. E. B. Garriott. 4to. 69 pp. 7 charts. 1900.

* Bulletin No. 1. Climate of Death Valley, Cal. M. W. Harrington. 8vo. 50 pp. 1892.

* Bulletin No. 2. New method for discussion of magnetic observations. F. H. Bigelow. 8vo. 41 pp. 1892.

* Bulletin No. 3. Relations of soil to climate. E. W. Hilgard. 8vo. 59 pp. 1892.

* Bulletin No. 4. Soils and soil moisture and crop distribution. Milton Whitney. 8vo. 90 pp. 1892.

* Bulletin No. 5. Fluctuations and movements of ground water at Whitewater, Wis. Franklin H. King. 8vo. 75 pp. 1892.

* Bulletin No. 6. Diurnal variation of barometric pressure. Frank N. Cole. 8vo. 32 pp. 1892.
* Bulletin No. 7. Report of first annual meeting of the American Association of State Weather Services. 8vo. 49 pp. 1893.
* Bulletin No. 8. Climatology of the cotton plant. P. H. Mell. 8vo. 68 pp. 1893.
* Bulletin No. 9. Forecasting of thunderstorms during the summer of 1892. N. B. Conger. 8vo. 54 pp. 1893.
* Bulletin No. 10. Climate of Chicago. H. A. Hazen. 8vo. 137 pp. 1893.
Bulletin No. 11. Report of International Meteorological Congress, Chicago, 1893. 8vo. Part I.* 206 pp. Plates X. 1894. Part II.* 377 pp. Plates XV. 1895. Part III. 188 pp. Plates XVIII. 1896. Part IV. *In press.* O. L. Fassig, Secretary.
* Bulletin No. 12. Condensation of atmospheric moisture. Carl Barus. 8vo. 104 pp. 1894.
* Bulletin No. 13. Temperatures injurious to food products in storage and transportation. H. E. Williams. 8vo. 20 pp. 1894.
Bulletin No. 14. Report of third annual meeting of the American Association of State Weather Services. 8vo. 31 pp. 1894.
* Bulletin No. 15. Protection from lightning. A. G. McAdie. 8vo. 26 pp. 1895.
Bulletin No. 16. Determination of aqueous vapor by means of spectrum. L. E. Jewell. 8vo. 12 pp. 1895.
* Bulletin No. 17. Weather Bureau work in connection with rivers of the United States. Willis L. Moore. 8vo. 106 pp. 1896.
* Bulletin No. 18. Report of fourth annual meeting of the American Association State Weather Services. 8vo. 55 pp. 1895.
Bulletin No. 19. Relative humidity of southern New England. A. J. Henry. 8vo. 23 pp. 1897.
* Bulletin No. 20. Storms, storm tracks, and weather forecasting. F. H. Bigelow. 8vo. 87 pp. 1896.
* Bulletin No. 21. Solar and terrestrial magnetism in relation to meteorology. F. H. Bigelow. 8vo. 176 pp. 1897.
Bulletin No. 22. Climate of Cuba; also weather of Manila. W. F. R. Phillips. 8vo. 23 pp. 1898.
Bulletin No. 23. Frost: when to expect it and how to lessen injury from. W. H. Hammon. 8vo. 37 pp. 1898.
* Bulletin No. 24. Convention of Weather Bureau officials, Omaha, Nebr., 1898. James Berry, Secretary. 8vo. 184 pp. 1899.
Bulletin No. 25. Weather forecasting; historical, practical, and theoretical. Willis L. Moore. 8vo. 16 pp. 1899.
Bulletin No. 26. Lightning and the electricity of the air. A. G. McAdie and A. J. Henry. 8vo. 74 pp. 1 chart. 3 plates. 1899.
* Bulletin No. 27. The probable state of the sky along the path of total eclipse of the sun, May 28, 1900. Observations of 1899. F. H. Bigelow. 8vo. 23 pp. 4 charts. 1899.
Bulletin No. 28. The climate of San Francisco, Cal. A. G. McAdie. 8vo. 30 pp. 1899.
* Bulletin No. 29. Frost fighting. A. G. McAdie. 8vo. 15 pp. 2 maps. 9 plates. 1900.
* Special report on the transfer of the Weather Bureau to the Department of Agriculture. M. W. Harrington. 8vo. 26 pp. 1891.
* Weather and wreck charts of the Great Lakes 1886–1893. M. W. Harrington. (1 sheet of atlas entitled Report, etc.)
* Rainfall laws. Dr. G. Hinrichs. 8vo. 94 pp. 6 plates. 1893.
* Certain climatic conditions of the Dakotas. (Senate Ex. Doc. No. 157.) J. P. Finley. 8vo. 206 pp. Charts XCV. 1893.
* Daily river stages. Principal rivers of the United States. Part IV. 1891–1893. Thomas Russell. 8vo. lxvii, 439 pp.
Charts XII. 1894.
* Protection from lightning. A. G. McAdie. 8vo. 20 pp. 11 plates. 1894.
* Wrecks on the Great Lakes from December 17, 1885, to November, 1893. M. W. Harrington. 8vo. 22 pp. 1894. (Reprint).
* Protection of food products from heat and cold during transportation. M. W. Harrington. 8vo. 7 pp. 1894.
Precipitation in Nebraska and South Dakota. (Senate Mis. Doc. No. 113.) A. J. Henry. 8vo. 33 pp. 1894.
* Weather Bureau Kite. C. F. Marvin. 8vo. 5 pp. Plate. 1895. (Reprint, M. W. R.)
The Marvin Seismograph. C. F. Marvin. 8vo. 6 pp. 1895. (Reprint, M. W. R.)
Constants and units used in meteorology. Cleveland Abbe. 8vo. 6 pp. 1896. (Extract, M. W. R.)
Cloud observations and an improved nephoscope. C. F. Marvin. 8vo. 12 pp. 1896. (Reprint, M. W. R.)
Sunstroke weather of August, 1896. 4to. 4 pp. W. F. R. Phillips. (Extract, M. W. R.)
* International meteorological symbols. (Weather Bureau Circular of information.) M.W. Harrington. 8vo. 5 pp. 1894.
* Atmospheric circulation in tropical cyclones. H. B. Boyer. 8vo. 17 pp. 17 plates. 1896.
* W. B. No. 63. Studies of weather types and storms. No. 1. Types of storms in January. E. B. Garriott. 4 pp. Charts. 1895.
* W. B. No. 81. Statistics of State Weather Services. O. L. Fassig. 8vo. 12 pp. 1896. (Reprint, M. W. R.)
W. B. No. 85. Departures from normal temperatures and rainfall, with crop yields in Nebraska. H. H. C. Dunwoody. 8vo. 30 pp. Charts. 1896.
* W. B. No. 86. Injury from frosts and methods of protection. 8vo. 12 pp. Charts. 1896.
* W. B. No. 92. Studies of weather types and storms. Part II. Weather Bureau officials. 4to. 24 pp. 38 plates. 1896.
* W. B. No. 102. St. Louis, Mo., tornado of May 27, 1896. H. C. Frankenfield and A. J. Henry. 8vo. 6 pp. Charts. 1896. (Reprint, M. W. R.)
W. B. No. 104. Responses to questions at the International Meteorological Conference, Paris, 1896. Willis L. Moore. 8vo. 29 pp. 1896.
W. B. No. 109. Sunshine recorders. Circular G, Instrument Division. C. F. Marvin. 8vo. 18 pp. 1896.
* W. B. No. 110. Kite experiments at the Weather Bureau. C. F. Marvin. 8vo. 115 pp. 21 plates. 1896. (Reprint, M. W. R.)
W. B. No. 112. Daily river stages. Principal rivers of the United States. Part V, 1893–1895. Park Morrill. 4to. 555 pp. 1896.
W. B. No. 122. Monograph on the mechanics and equilibrium of kites. C. F. Marvin. 71 pp. 1897. (Reprint, M. W. R.)
* W. B. No. 124. Standard system of coordinates for magnetic and meteorological observations. F. H. Bigelow. 8vo. 7 pp. 1897. (Reprint, M. W. R.)
* W. B. No. 125. Wind barometer table. E. B. Garriott. 8vo. 5 pp. Charts. 1897. (Reprint, M. W. R.)
* W. B. No. 126. Clothing and temperature. W. F. R. Phillips. 8vo. 6 pp. 1897. (Reprint, M. W. R.)
W. B. No. 130. Equations of hydrodynamics and forms applicable to the problems in meteorology. Joseph Cottier. 4to. 8 pp. 1897. (Reprint, M. W. R.)
W. B. No. 138. United States daily atmospheric survey. Willis L. Moore. 8vo. 6 pp. 1897.

W. B. No. 140. Forests and rainfall. H. A. Hazen. 8vo. 2 pp. 1897. (Reprint, M. W. R.)
*W. B. No. 142. The probable state of the sky along the path of total eclipse of the sun, May 28, 1900. F. H. Bigelow. 8vo. 7 pp. 1 chart. 1897. (Reprint, M. W. R.)
*W. B. No. 145. Highest kite ascension at Blue Hill. S. P. Fergusson. 8vo. 4 pp. 1897. (Reprint, M. W. R.)
W. B. No. 148. An improved sunshine recorder. D. T. Maring. 8vo. 15 pp. 1897. (Reprint, M. W. R.)
W. B. No. 149. A winter barograph curve from the South Pacific Ocean. R. de C. Ward. 8vo. 8 pp. 1897. (Reprint, M. W. R.)
W. B. No. 159. Wrecks and casualties on the Great Lakes, 1895, 1896, and 1897. Norman B. Conger. 8vo. 20 pp. 3 charts. 1898.
W. B. No. 162. Normal annual sunshine and snowfall. A. J. Henry. 4to. 5 pp. 1898.
W. B. No. 166. Instructions for aerial observers. Circular K, Instrument Division. C. F. Marvin. 8vo. 33 pp. 1898.
W. B. No. 168. Cyclonic circulation and the translatory movement of West Indian hurricanes. Rev. Benito Viñes, S. J. 8vo. 34 pp. 1898.
W. B. No. 171. Moisture tables. C. F. Marvin. 8vo. 9 pp. 1898. (Reprint, M. W. R.)
*W. B. No. 179. The probable state of the sky along the path of total eclipse of the sun, May 28, 1900. F. H. Bigelow. 8vo. 8 pp. 1898. (Reprint, M. W. R.)
W. B. No. 180. Aneroid barometers. C. F. Marvin. 8vo. 6 pp. 1898. (Reprint, M. W. R.)
*W. B. No. 188. Climate and crop report, Alaska section. H. L. Ball. 8vo. 7 pp. 1899. (Reprint, M. W. R.)
W. B. No. 193. Measurement of precipitation. Circular E, Instrument Division. C. F. Marvin. 8vo. 28 pp. 1899.
*W. B. No. 194. Hydrology of the Lake Minnetonka watershed. S. W. Corley. 8vo. 10 pp. 1899. (Reprint, M. W. R.)
W. B. No. 199. Property loss by lightning, 1898. A. J. Henry and A. G. McAdie. 8vo. 16 pp. 1899. (Extract from Bulletin No. 26.)
W. B. No. 201. Climatology of the Isthmus of Panama. H. L. Abbot. 8vo. 19 pp. 1899. (Reprint, M. W. R.)
W. B. No. 202. An advance in measuring and photographing sounds. B. F. Sharp. 8vo. 18 pp. 1899. (Reprint, M. W. R.)
*W. B. No. 203. Variations in lake levels and atmospheric precipitation. A. J. Henry. 8vo. 8 pp. 1899. (Reprint, M. W. R.)
W. B. No. 223. Anemometer tests. C. F. Marvin. 8vo. 18 pp. 1900. (Reprint, M. W. R.)
W. B. No. 227. Daily river stages. Principal rivers of the United States. Part VI, 1896–1899. Weather Bureau. 4to. 446 pp. 1900.
W. B. No. 228. Tables of daily precipitation for 1893–1895, inclusive. (Completed only to "P.") Weather Bureau. 8vo. 256 pp. 1900.
W. B. No 231. Report of the Chief of the Weather Bureau. 1900. 8vo. 15 pp.
W. B. No. 233. Anemometry. Circular D, Instrument Division. C. F. Marvin. 8vo. 67 pp. 1900.
W. B. No. 235. Psychrometric tables. C. F. Marvin. 8vo. 84 pp. 1900.
W. B. No. 237. Meteorological chart of the Great Lakes for season of 1900. A. J. Henry and N. B. Conger. 4to. 23 pp. 1901.
W. B. No. 241. Barometers and measurement of atmospheric pressure. Circular F, Instrument Division. C. F. Marvin. 8vo. 94 pp. 1901.

WIND AND TEMPERATURE.

A correspondent has proposed the following question:

Given, a close fence 12 or 14 feet high running from the northeast to the southwest, or directly athwart a blizzard from the northwest, a thermometer being on each side of the fence about 5 feet from the ground. If the thermometer on the north side indicates 15° above zero what will the instrument on the lee side show?

I know from practical experience the great and appreciable difference in the two sides to animal life but have no knowledge of the effect these two positions of the thermometer have upon the mercury. Will you kindly tell me? If, as some claim, there is very little, then why should a man exposed on the north side freeze to death, while on the south side he would survive without much injury? In one case the cold cuts to the marrow, in the other by buttoning up one's coat only a chilly sensation is experienced. Is not vegetable life in this particular affected much the same as animal life, or in other words would not a tender tree on each side of this high fence fare much the same as two men, one on each side of it?

There is no appreciable difference between the temperature of the air on the windward and leeward sides of a fence, or of any other form of windbreak. Animals seek shelter from the wind for the reason that it conveys away the heat of their bodies much faster than does the quiet air, since the covering provided for their protection by nature is not impervious to strong winds. For the same reason, a man will perish in a high wind with a temperature that would cause him little discomfort in a calm, since in the presence of a strong wind his clothing is incapable of retaining his bodily heat.

The lowest temperatures and those that produce frosts and destruction to vegetation usually occur after the wind has died down, and are due to excessive radiation of heat from the ground and from the plants into space. Under these conditions the plants are sometimes colder than the air itself, so that a fence could be of no possible use to the plants; in fact it is well known that under these circumstances a wind brings warm air to prevent frost.

When a cold wave is coming on, the plants are, of course, cooled by the cold air that is continually passing by them, and if this cold air can be held back and the warm air retained the plants will be protected; but a fence on the windward side of the field would hardly effect this, since cold air has a tendency to descend to the ground and warm air to rise. A covering of some sort is therefore the only means of retaining the desired heat, and the same covering will also prevent the lowering of the temperature by radiation.

It is for these reasons that the Weather Bureau in its publications has always advocated screens, smudges, etc., as a protection against frost.

REDUCTION TO STANDARD GRAVITY AT MEXICAN STATIONS.

In order to correct the barometer for the variations in gravity we have to consider the fact that not only does the force of gravity, combined with the centrifugal force due to the diurnal rotation of the earth, vary with the latitude of the station, but there is also a small variation depending on the altitude of the station above sea level and the mass of the mountain or plateau on which the station rests. Some account of this problem has been given in the MONTHLY WEATHER REVIEW for December, 1896, p. 463, July, 1898, p. 314, and December, 1898, p. 550, at least in so far as concerns the United States. In Mexico the problem of the reduction to standard gravity is one of special importance, since great differences of altitude occur at stations very close together. As all Mexican stations, so far as they are mentioned in the accompanying table, use mercurial barometers, the corrections have therefore been computed by Señor Pastrana according

to the rules and tables given in the International Meteorological Tables, published by the International Committee in 1890. These computations will be subject to slight revision whenever the actual force of gravity shall have been determined at these stations. In reducing observations published in earlier numbers of the MONTHLY WEATHER REVIEW so as to be comparable with those published in the MONTHLY WEATHER REVIEW for May, and succeeding months, the following table will be convenient. It has already been adopted by the Central Observatory of Mexico, and was first used in reducing the Mexican data for May.

Table for reducing local barometric pressures by mercurial barometers at Mexican stations to standard gravity.

Station and observatories.	Metric system.			English system.		
	Latitude term.	Altitude term.	Total.	Latitude term.	Altitude term.	Total.
	Mm.	*Mm.*	*Mm.*	*Inch.*	*Inch.*	*Inch.*
Chihuahua (Obs. d. Est.)	−0.90	−0.18	−1.08	−0.035	−0.007	−0.042
Colima (Sem.)	−1.46	−0.07	−1.53	−0.058	−0.003	−0.061
Culiacan (Est.)	−1.27	−0.00	−1.27	−0.050	−0.000	−0.050
Durango (Sem.)	−1.06	−0.22	−1.28	−0.042	−0.009	−0.051
Guadalajara (Hos. d. Belen)	−1.23	−0.19	−1.42	−0.048	−0.007	−0.055
Guanajuato (Est.)	−1.15	−0.24	−1.39	−0.045	−0.009	−0.054
Jalapa (Est.)	−1.31	−0.18	−1.49	−0.052	−0.007	−0.059
Leon (Est.)	−1.19	−0.22	−1.41	−0.047	−0.009	−0.056
Linares (Obs. particular)	−1.23	−0.05	−1.28	−0.048	−0.002	−0.050
Mazatlan (Obs. Ast. and Met.)	−1.36	−0.00	−1.36	−0.054	−0.000	−0.054
Merida (Est.)	−1.43	−0.00	−1.43	−0.056	−0.000	−0.050
Mexico (Obs. Cent.)	−1.18	−0.26	−1.44	−0.046	−0.010	−0.056
Monterrey (Est.)	−1.16	0.07	−1.24	−0.046	−0.003	−0.059
Morelia (Sem.)	−1.22	−0.23	−1.45	−0.048	−0.009	−0.057
Oaxaca (Est.)	−1.36	−0.20	−1.56	−0.054	−0.008	−0.062
Pachuca (Est.)	−1.13	−0.27	−1.40	−0.044	−0.011	−0.055
Puebla	−1.21	−0.26	−1.47	−0.048	−0.010	−0.058
Queretaro (Est.)	−1.20	−0.22	−1.42	−0.047	−0.009	−0.056
Real del Monte (Comp. Minera)	−1.09	−0.30	−1.39	−0.043	−0.013	−0.055
Saltillo (Col. S. Juan Nepomuceno)	−1.03	−0.20	−1.23	−0.041	−0.008	−0.049
San Luis Potosi (Inst. Cient.)	−1.14	−0.22	−1.36	−0.045	−0.009	−0.054
Tampico (Hos. Mil.)	−1.41	−0.00	−1.41	−0.056	−0.000	−0.056
Toluca (Est.)	−1.13	−0.30	−1.43	−0.044	−0.012	−0.056
Tuxtla Gutierrez (Est.)	−1.55	−6.08	−1.63	−0.061	−0.003	−0.064
Zacatecas (Est.)	−1.04	−0.27	−1.31	−0.041	−0.011	−0.052
Zapotlan (Sem.)	−1.28	−0.19	−1.47	−0.050	−0.007	−0.057

SNOWFALL AND ITS EQUIVALENT IN WATER.

Prof. A. G. McAdie, Forecast Official, San Francisco, calls attention to the snowfall at Fordyce, Cal., on February 8. The voluntary observer, Mr. E. E. Roeming, carefully measured the depth of the snow on this occasion as being 36 inches, but when melted it amounted only to 1.70, and he adds that when the temperature is only 15° F. during the snowfall, it takes a large amount to make an inch of water. The ratio of snow to water in this case is as 21 to 1, and Professor McAdie states that he has been told by reliable observers in the mountains of California that a ratio of 17 to 1 sometimes prevails.

Of course it is well known that the ratio of 10 to 1, which is used by the Weather Bureau when there have been no actual measurements of the melted water, is at best a crude approximation, since the ratio may vary anywhere between 3 and 20. The ratio of 21 to 1 observed on February 8 by Mr. Roeming is rare, but by no means unique. In fact, other measurements made by him during the same month of March give the following ratios:

March 2, 20; March 3, 20; March 4, 17; March 5, 7.5; March 6, —; March 7, 20; March 8, 21; March 18, 8; March 19, 2.5.

All these snowfalls occurred with southeast or southwest winds. The temperatures are not given on his monthly form. There are many days on which the depth of snowfall is not given, so that the total monthly snowfall of 107 inches and the total equivalent precipitation, 16.34, may not be precisely comparable. As they stand, however, they give an average ratio of snowfall to melted water 6.5 to 1.

HAIL INSURANCE.

In a clipping from the Advance, of Stillwater, Okla., we note that a severe hailstorm devastated a strip of country 4 miles wide and 18 miles long near El Reno, Okla., on May 15. The report states that live stock was killed, and wheat fields, orchards, and all growing crops within the storm's path were totally destroyed. The loss was estimated at $80,000, but a part of this was covered by hail insurance. The placing of insurance against loss from this source was commended in the April number of the MONTHLY WEATHER REVIEW.

A fall of hail to the average depth of 1 inch over a region 4 miles wide and 18 miles long is a fall of 167,340,000 cubic feet of ice. Ice weighs between 55 and 57 pounds per cubic foot. This total mass, therefore, represents very nearly 1,000,000 tons (2,000 pounds to the ton). But this mass must have been raised up from the ocean level to that of the clouds by some previous meteorological agency. The average elevation from which it fell may be taken as 5,000 feet. Now to raise 1,000,000 tons 5,000 feet is to do 5,000,000 foot-tons of work. But in estimating the power of an engine to do work we speak of foot-pounds per minute or horsepower; we say 1-horsepower is the ability to raise 33,000 pounds 1 foot in 1 minute; therefore, an engine of 1-horsepower is able to raise almost exactly 1,000 tons one foot in one hour, or one-fifth of a ton 5,000 feet in one hour, or 1 ton 5,000 feet in five hours. The work of raising 1,000,000 tons of ice by evaporation from the ocean water up to the level of the clouds may therefore be considered as representing the work done by an engine of 1,000,000 horsepower, and therefore represents the work of a 1,000,000-horsepower engine working for five hours. When this ice falls to the ground the force of gravity does the same amount of work upon it that the local winds had done in raising it to the cloud level against the force of gravity. If we are to prevent the ice from falling we must do this same amount of work per hour, or we must work at the same rate per hour and must keep up the work as long as the hail is to be held up, but it does not seem likely that man will ever be able to invent any method that can accomplish this result. Certainly the discharge of a few cannon will not do it.

WEATHER BUREAU MEN AS INSTRUCTORS.

Mr. S. M. Blandford, Observer, Boise, Idaho, reports that he lectured before the graduating class of the high school of that city on May 16 on the organization, growth, and functions of the Weather Bureau. The class, with its instructors, also visited the Weather Bureau office, and the various instruments were explained by the observer.

At Phoenix, Ariz., on May 22, Mr. W. G. Burns, Section Director, explained the use of the various instruments, and, by means of a series of weather maps, showed the movements of cyclones and anticyclones and the attendant weather changes, to an advanced class from the local high school.

At San Diego, Cal., on May 15, the senior class of the San Diego Normal School was entertained at the local Weather Bureau office by Observer Ford A. Carpenter, who gave an informal talk on the general work of the Bureau and explained the causes of some of the local peculiarities of climate.

Local Forecast Official I. M. Cline lectured to the South Texas Truck Growers' Association, at Edna, Tex., on May 9.

Section Director T. B. Jennings lectured on the weather and the Weather Bureau before the teachers and older scholars of the Lincoln School at Topeka, Kans., on May 29.

Observer Charles E. Linney lectured on the weather and weather forecasting before the Ladies' Aid Society of the Union Congregational Church at Auburn Park, Chicago, Ill.,

on May 31. The lecture was illustrated by means of instruments and charts.

Section Director J. B. Marbury has, during the past spring, delivered three lectures before the class in physical geography of the Boys' High School at Atlanta, Ga., his subjects being: "Weather Bureau instruments," "The weather map," and "Weather forecasts." Mr. Marbury states that his lectures were well received, and he is satisfied they have greatly increased the popularity of the Weather Bureau in his section. No doubt this is true of all the lectures delivered, since Weather Bureau methods only need to be known to be appreciated. There is no better way of disseminating knowledge than through the public schools of our land, and we note with pleasure the number of high schools that are interested in the work of the Weather Bureau, as evinced by the above lectures.

ANNUAL MEETING OF THE GERMAN ASSOCIATION OF INVESTIGATORS AND PHYSICIANS.

The Seventy-third Annual Meeting of the German Association of Investigators and Physicians (Deutsche Naturforscher und Aerzte) will be held in Hamburg September 22–28. A general invitation is extended to all interested in the sciences. Among the papers that are announced in the official preliminary program, the following will interest meteorologists:

Ahlhorn. On the mechanism of the resistance of fluid media.
Gleichen. The brightness and color of the eclipsed moon.
Mueller-Erzbach. The measurement of vapor pressure by means of evaporation.
Walter. A photographic apparatus for the more accurate analysis of the lightning flash.
[The apparatus suggested by G. K. Gilbert and constructed under the direction of A. Graham Bell in 1898, and mounted on the roof of the Weather Bureau, is also worth mentioning in this connection.—ED.]
Arctowski. On the auroral observations of the Belgian Antarctic Expedition.
" On the scientific problems of antarctic exploration.
Van Bebber. The present condition of weather telegraphy and weather forecasting.
Charlier. The astronomical explanation of a glacial period.
Eyre. Weather types and the daily forecast service of the Uslar Observatory (illustrated by photographs).
Floegel. Observations with the variometer and description of a convenient form of variometer.
Halm. On the relation of terrestrial magnetism to seismological processes and its importance to practical and theoretical astronomy.
Jensen. Facts and theories in reference to polarization of atmospheric sky light.
Koeppen. On meteorological kite ascensions with one or more practical exhibitions.
von Konkoly. The meteorological institute, the observatory, and the net work of stations in Hungary, with lantern slides.
Krebs. On the conditions governing water in the soil.
Lecointe. On the magnetic observations in the antarctic regions.
Maier. Dissipation of electricity in the free atmosphere.
Moeller. Observations of the weather since 1893, in Brunswick.
v. Neumayer. Recent magnetic work in the polar regions.
Satke. On cloud forms, especially the cirri.
Schmidt. The problems and the establishment of a bureau of computations relative to terrestrial magnetism.
Schubert. The interchange of heat between the ground, the water, and the atmosphere.
van der Stok. The observation and study of tidal phenomena on the coast of Holland.

MR. GUSTAVUS A. HYDE.

Through a press clipping from the Cleveland, Ohio, World, we recently learned that Mr. Gustavus A. Hyde, a civil engineer of that city, is one of Espy's original observers, and is now still engaged in meteorological work as a voluntary observer of the United States Weather Bureau. So far as we know, Mr. Hyde is the only one of Espy's pioneer observers who can show an uninterrupted record down to the present time, but if others are known to the readers of the REVIEW, the Editor will be glad to receive their names and addresses.

Continuous records of this character, antedating the official records of the Weather Bureau by many years, are of great value in studying the secular changes in the climate of a place, and Mr. Hyde has rendered a service to his community and to meteorologists generally that should not be allowed to pass unnoticed.

We reproduce in Plate IV an excellent photograph of Mr. Hyde, and, at our request, he has prepared, for publication in the REVIEW, the following autobiographical sketch:

The subject of this notice was born at Framingham, Mass., January 15, 1826. In 1842, having a curiosity to observe and record temperatures, he purchased a thermometer—an instrument rarely seen in those days—and commenced taking and recording any changes of temperature worthy of record. In December, 1842, there appeared in the newspapers a request from Prof. James P. Espy, of Washington, D. C, for voluntary observers to take observations of the temperature of the air, direction and force of the wind, beginning and ending of rain, and other meteorological phenomena of interest, and to forward the same to him at Washington, D. C., to enable him to demonstrate the correctness of his theories with reference to storms passing over our country. Mr. Hyde commenced his observations February 1, 1843, and made a complete record for the eleven months of that year. His name appears in the list of voluntary observers reported by Professor Espy to the Secretary of the Navy in 1844. For several years following, his records were intermittent, by reason of changes in residence and business interferences.

In 1855 Mr. Hyde moved to Cleveland, Ohio, and on the first of May of that year began a complete record of the temperature, wind, rain and snow, and the state of the sky, which has been continued to the present time, making forty-six years of complete record at the city of Cleveland, Ohio. Copies of this record have been sent to the various departments that have had charge of meteorological information during all of these years.

Mr. Hyde is probably one of a very few of Espy's original meteorological observers now living, and may be the only one who is now in the service of the Weather Bureau.

During Mr. Hyde's residence at Cleveland he has frequently furnished for public information copies of his observations for weeks, months, and years, and has made addresses before scientific societies and schools of the city on the storms of our country. After forty years' residence at Cleveland he published and distributed a summary and review of his observations for that period, showing the local peculiarities in the temperature, sky, wind, rain, and snow.

He is still a voluntary observer for the Weather Bureau.

ERRATA.

MONTHLY WEATHER REVIEW for April, 1901, page 163, table of Mexican data for April, 1901, last line, for "relative humidity, 63," read "36," and for "precipitation, ...," read "0.00."

WEATHER REVIEW, December, 1900, page 536, 2d column, last equation, for

$$= \tfrac{1}{2}(q^2_3 + q^2_2 - q^2_4 - q^2_1) + g(z_3 + z_2 - z_4 - z_1),$$

read

$$= \tfrac{1}{2}(q^2_2 + q^2_4 - q^2_1 - q^2_3) + g(z_2 + z_4 - z_1 - z_3).$$

Mr. H. Pittier requests that on page 208 of this REVIEW, in table 3, rainfall at stations in Costa Rica, 1901, the rainfall for Zent be corrected to read "23 millimeters" instead of "30 millimeters."

THE WEATHER OF THE MONTH.

By ALFRED J. HENRY, Professor of Meteorology.

CHARACTERISTICS OF THE WEATHER FOR MAY.

May, 1901, was in some respects like the preceding month. The few areas of low pressure which appeared within the field of observation moved slowly, and in one or two cases followed an erratic course. It was also like the preceding month, in that monthly mean pressure was decidedly low in the South Atlantic States and relatively high in the Lake region. In consequence of this distribution of pressure heavy rains fell east of the Appalachians and also in the Southwest, particularly in Oklahoma, northern Texas, and northeastern New Mexico. In the Mississippi, Missouri, and lower Ohio valleys, and the Lake region the rainfall was below the seasonal average. Temperature, on the other hand, was markedly above the normal from the upper Lake region west and southwest to the middle Rocky Mountain districts, and northward to the Canadian boundary. As in the previous month, the number of thunderstorms and violent local winds was remarkably small.

The most striking characteristic of the month was the diminution in monthly mean pressure over the South Atlantic States.

PRESSURE.

The distribution of monthly mean pressure is graphically shown on Chart IV and the numerical values are given in Tables I and VI.

As stated in the preceding paragraph, pressure was relarelatively high over the upper Lake region and on the Pacific coast. It was relatively low over the South Atlantic States and in the Plateau region of the west. As compared with the preceding month there was a marked fall in all regions, especially in the St. Lawrence Valley and the Lake districts. Pressure was below the normal everywhere, except on the north Pacific coast and eastern Manitoba, including the Valley of the Red River of the North.

Pressure has been below the normal in the South Atlantic States continuously since and including January of the current year. The tendency of the areas of low pressure to skirt the South Atlantic coast States was especially pronounced in the preceding as well as the current month. In the latter month, moreover, there was an absence of areas of high pressure which, in a normal month, move southeasterly from the upper Mississippi Valley and merge with the permanent area of high pressure over the middle Atlantic.

TEMPERATURE OF THE AIR.

The distribution of monthly mean surface temperature, as deduced from the records of about 1,000 stations, is shown on Chart VI.

Temperature continued about normal or below the seasonal average in the South Atlantic States; also in southern New England, the Ohio Valley, and in portions of the Southwest. The greatest positive departures were recorded mainly in the Rocky Mountain districts north of the thirty-fifth parallel and in the upper Missouri and upper Mississippi valleys. Over this great region temperature was almost continuously above the seasonal average. It is worthy of mention that temperature has been unusually high in this region almost continuously since the first of the year. Maximum temperatures of 100° and over were registered in the Rio Grande Valley and elsewhere in western Texas; also in eastern Montana and in the interior valleys of California and Arizona. In portions of the Lake region and in northern New England maximum temperatures as high as 80° were not recorded. Minimum temperatures as low as the freezing point were observed in northern Michigan, northern Minnesota, and quite generally in North Dakota, portions of South Dakota, and throughout the Rocky Mountain region.

The average temperature for the several geographic districts and the departures from the normal values are shown in the following table:

Average temperatures and departures from the normal.

Districts.	Number of stations.	Average temperatures for the current month.	Departures for the current month.	Accumulated departures since January 1.	Average departures since January 1.
		°	°	°	°
New England	10	52.4	− 1.5	− 4.8	− 1.0
Middle Atlantic	12	60.3	− 1.3	− 5.3	− 1.1
South Atlantic	10	70.2	0.0	−11.0	− 2.2
Florida Peninsula	7	75.8	− 0 2	−12.3	− 2.5
East Gulf	7	72.3	− 0.4	−10.4	− 2.1
West Gulf	7	72.5	− 0.1	+ 0.4	+ 0.1
Ohio Valley and Tennessee	12	63.9	− 1.3	−10.0	− 2 0
Lower Lake	8	55.7	− 1.0	− 5.8	− 1.2
Upper Lake	9	52.2	+ 0.8	+ 3.2	+ 0.6
North Dakota	8	60.6	+ 7.2	+23 0	+ 4.6
Upper Mississippi Valley	11	62.2	+ 0 8	+ 2.7	+ 0.5
Missouri Valley	10	62 3	+ 2.2	+12.7	+ 2.5
Northern Slope	7	59.3	+ 5.9	+14.6	+ 2.9
Middle Slope	6	62.7	+ 0.7	+ 1.4	+ 0.3
Southern Slope	6	67.2	− 1.6	− 0.5	− 0.1
Southern Plateau	15	62 4	− 1.4	+ 4.2	+ 0.8
Middle Plateau	9	58.2	+ 2.4	+10.7	+ 2.1
Northern Plateau	10	57.7	+ 3.4	+10.0	+ 2.0
North Pacific	9	53.1	− 1.3	− 2.5	− 0.5
Middle Pacific	5	56.9	− 1.5	− 0.2	0.0
South Pacific	4	61.0	− 1.4	+ 4.0	+ 0.8

In Canada Prof. R. F. Stupart says:

The temperature was higher than normal by between 6° and 10° in Manitoba and the eastern portions of the Northwest Territories; the positive departure diminishing both westward and eastward, 3° in excess in Alberta, lessening to either just average or 1° below on Vancouver Island. In New Ontario and northern Quebec the positive departure from average was about 4°, which difference lessened southward, until in southern Ontario, near Lake Erie, the mean was just equal to average, as was also the case in southern Nova Scotia. In Manitoba unusually high temperature was maintained throughout the month, but in Ontario an unusually high temperature during the first half was succeeded by a fortnight of temperatures nearly as much below normal as before they had been above.

PRECIPITATION.

Rainfall was greatly above the average in a number of districts and correspondingly deficient in others. The greatest deficiency occurred in the lower Missouri Valley, where negative departures of 3 inches were recorded. There was a large deficiency also in the Ohio Valley, Lake region, upper Mississippi Valley, and throughout the Dakotas. Rainfall was decidedly above the average in Montana and also in New Mexico, northern Texas, and elsewhere west of the one hundred and fifth meridian.

The area of deficient rainfall included practically all of the spring wheat region, as well as much territory to the east-

ward, and was surrounded, singularly enough, by a belt of much higher rainfall, the positive departures being from 2 to 4 inches almost on the periphery of the drought-stricken region.

Average precipitation and departure from the normal.

Districts.	Number of stations.	Average.		Departure.	
		Current month.	Percentage of normal.	Current month.	Accumulated since Jan. 1.
		Inches.		*Inches.*	*Inches.*
New England	10	5.56	132	+1.9	+2.4
Middle Atlantic	12	4.58	134	+0.9	−1.2
South Atlantic	10	6.35	161	+2.4	+0.7
Florida Peninsula	7	3.92	106	+0.2	+1.0
East Gulf	7	5.19	118	+0.8	+1.3
West Gulf	7	2.36	53	−2.1	−7.6
Ohio Valley and Tennessee	12	3.61	95	−0.2	−5.6
Lower Lake	8	2.96	85	−0.5	−1.3
Upper Lake	9	2.35	63	−1.4	−3.7
North Dakota	8	0.42	17	−2.0	−3.4
Upper Mississippi Valley	11	2.10	50	−2.1	−4.3
Missouri Valley	10	1.65	39	−2.6	−4.1
Northern Slope	7	2.71	112	+0.3	+0.3
Middle Slope	6	2.37	66	−1.2	−1.7
Southern Slope	6	4.55	121	+0.8	+2.2
Southern Plateau	15	1.01	166	+0.4	+1.3
Middle Plateau	9	1.28	119	+0.2	+0.2
Northern Plateau	10	1.68	94	−0.1	−1.1
North Pacific	9	3.36	114	+0.4	+1.0
Middle Pacific	5	0.90	56	−0.7	−0.3
South Pacific	4	0.86	239	+0.5	+2.0

In Canada.—Professor Stupart says:

The rainfall was very much in excess of average in southern Alberta and in western Assiniboia. It was also in excess, but to a lesser extent, in Ontario, except in the extreme western and eastern portions where it was either average or a little below. Throughout Quebec departures in either direction were not marked; in the Maritime Provinces there was a slight and general excess, and in southern Manitoba and eastern Assiniboia a fairly marked deficiency. In Ontario most of the rain fell after the 17th. Barkerville, Cariboo, reports: No snow remains on the flats, but 4 feet on the mountain trails, leaving slowly.

HAIL.

The following are the dates on which hail fell in the respective States:

Alabama, 6, 7, 12, 16, 17, 20, 25, 30, 31. Arizona, 2, 13, 14, 17, 22, 25, 26, 31. Arkansas, 5, 6, 10, 11, 12, 16, 20, 21, 24, 30. California, 1, 5, 10, 18, 19, 24, 25, 26, 28. Colorado, 1, 2, 6, 7, 12, 13, 15, 16, 18, 19, 20, 21, 22, 27, 28, 29, 30, 31. Connecticut, 24. Delaware, 25. Florida, 7, 26. Georgia, 5, 6, 10, 12, 18, 19, 20, 25, 28, 30, 31. Idaho, 18, 19, 27. Illinois, 2, 5, 6, 9, 20, 23, 24, 27. Indiana, 5, 9, 10, 23, 24, 25. Indian Territory, 9, 15, 16, 17, 22, 30. Iowa, 4, 5, 22, 24. Kansas, 2, 3, 4, 5, 15, 22, 29. Kentucky, 8, 18, 24. Louisiana, 7, 18, 20, 30, 31. Maryland, 11, 24, 25, 30. Massachusetts, 24. Michigan, 2, 3, 8, 12, 13, 14, 15, 22, 23, 24, 28, 29. Minnesota, 1, 2, 11. Mississippi, 12, 13, 14, 24, 30, 31. Missouri, 4, 5, 6, 15, 19, 20, 21, 23, 29. Montana, 15, 18, 29. Nebraska, 2, 3, 4, 5, 10, 23. Nevada, 1, 2, 7, 11, 13, 23, 24, 27, 28. New Hampshire, 3, 24. New Jersey, 15, 18, 29. New Mexico, 2, 7, 20, 30. New York, 13, 17, 24, 31. North Carolina, 5, 6, 8, 9, 10, 12, 13, 14, 22, 28, 30. North Dakota, 9, 10. Ohio, 2, 3, 6, 7, 8, 9, 10, 12, 19, 20, 21, 24, 30. Oklahoma, 9, 13, 15. Oregon, 11, 14, 15, 17, 18, 19, 24, 25, 27, 28. Pennsylvania, 2, 3, 10, 11, 17, 18, 24, 31. South Carolina, 6, 7, 18, 19, 26. South Dakota, 3, 4, 9, 15. Tennessee, 6, 9, 11, 12, 18, 24, 27, 28, 30. Texas, 1, 2, 4, 9, 10, 12, 14, 15, 16, 17, 19, 23, 24, 29, 30, 31. Utah, 2, 7, 21, 24, 26, 28, 29, 30. Virginia, 9, 10, 17, 24, 25, 28, 29. Washington, 7, 17, 18, 19, 21, 28. West Virginia, 7, 8, 9, 10, 18, 22, 24, 25, 28, 31. Wisconsin, 2, 12, 16, 23. Wyoming, 2, 3, 4, 5, 12, 14, 15, 21, 27, 28, 30.

SLEET.

The following are the dates on which sleet fell in the respective States:

California, 1, 2, 3, 18, 24, 25, 26. Colorado, 2, 3, 30, 31. Minnesota, 11. Montana, 9, 17, 18. Utah, 1, 2, 3, 22.

HUMIDITY.

The averages by districts appear in the subjoined table:

Average relative humidity and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
	%			%	
New England	82	+ 4	Missouri Valley	60	− 5
Middle Atlantic	74	+ 3	Northern Slope	64	+ 7
South Atlantic	76	+ 2	Middle Slope	62	+ 2
Florida Peninsula	75	− 2	Southern Slope	64	+ 6
East Gulf	67	− 5	Southern Plateau	36	+ 6
West Gulf	73	0	Middle Plateau	48	+ 3
Ohio Valley and Tennessee	67	− 1	Northern Plateau	59	+ 1
Lower Lake	76	+ 6	North Pacific Coast	76	− 2
Upper Lake	76	+ 4	Middle Pacific Coast	72	0
North Dakota	57	− 7	South Pacific Coast	72	+ 4
Upper Mississippi	65	− 2			

SUNSHINE AND CLOUDINESS.

The distribution of sunshine is graphically shown on Chart VII, and the numerical values of average daylight cloudiness, both for individual stations and by geographical districts, appear in Table I.

The averages for the various districts, with departures from the normal, are shown in the table below:

Average cloudiness and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
New England	6.6	+1.1	Missouri Valley	4.2	−1.2
Middle Atlantic	6.4	+1.2	Northern Slope	4.8	−0.6
South Atlantic	5.2	+0.8	Middle Slope	4.6	−0.2
Florida Peninsula	4.0	−0.5	Southern Slope	4.6	+0.1
East Gulf	4.2	−0.1	Southern Plateau	2.6	+0.4
West Gulf	4.6	−0.3	Middle Plateau	4.7	+0.6
Ohio Valley and Tennessee	5.3	+0.2	Northern Plateau	5.7	+0.1
Lower Lake	6.2	+1.0	North Pacific Coast	6.6	+0.7
Upper Lake	6.1	+0.6	Middle Pacific Coast	4.4	+0.2
North Dakota	3.1	−2.2	South Pacific Coast	4.8	+0.6
Upper Mississippi	4.7	−0.5			

WIND.

The maximum wind velocity at each Weather Bureau station for a period of five minutes is given in Table I, which also gives the altitude of Weather Bureau anemometers above ground.

Following are the velocities of 50 miles and over per hour registered during the month:

Maximum wind velocities.

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
Amarillo, Tex	2	51	sw.	Mount Tamalpais, Cal.	10	50	nw.
Block Island, R. I	19	55	e.	Do.	12	65	nw.
Denver, Colo.	2	50	s.	Do.	14	55	nw.
El Paso, Tex.	31	72	ne.	Do.	17	71	nw.
Fort Worth, Tex.	16	58	w.	Do.	18	64	nw.
Mount Tamalpais, Cal.	2	54	nw.	Do.	23	68	nw.
Do.	9	50	nw.	New York, N. Y.	3	62	nw

ATMOSPHERIC ELECTRICITY.

Numerical statistics relative to auroras and thunderstorms are given in Table IV, which shows the number of stations from which meteorological reports were received, and the number of such stations reporting thunderstorms (T) and auroras (A) in each State and on each day of the month, respectively.

Thunderstorms.—Reports of 2,479 thunderstorms were received during the current month as against 3,855 in 1900 and 1,202 during the preceding month.

The dates on which the number of reports of thunderstorms for the whole country were most numerous were: 24th, 340; 10th, 221; 2d, 220.

Reports were most numerous from: Ohio, 287; Colorado, 233; North Carolina, 229.

Auroras.—The evenings on which bright moonlight must have interfered with observations of faint auroras are assumed to be the four preceding and following the date of full moon, viz: April 29 to May 7.

In Canada.—Thunderstorms were reported as follows: Halifax, 12th, 13th; Yarmouth, 12th; Charlottetown, 13th; Bissett, 11th, 17th; Kingston, 18th; Toronto, 2d, 9th, 12th, 24th, 30th; White River, 2d, 31st; Port Stanley, 2d, 8th, 24th; Parry Sound, 2d; Winnipeg, 1st; Minnedosa, 1st; Qu' Appelle, 3d; Medicine Hat, 7th, 9th, 18th, 19th, 21st, 22d, 28th, 29th, 30th; Swift Current, 6th, 19th, 23d, 29th, 30th; Prince Albert, 19th; Battleford, 1st, 3d, 7th, 8th, 30th; Barkerville, 16th; Hamilton, Bermuda, 7th, 28th.

DESCRIPTION OF TABLES AND CHARTS.

By ALFRED J. HENRY, Professor of Meteorology.

Table I gives, for about 145 Weather Bureau stations making two observations daily for and about 25 others making only one observation, the data ordinarily needed for climatological studies, viz, the monthly mean pressure, the monthly means and extremes of temperature, the average conditions as to moisture, cloudiness, movement of the wind, and the departures from normals in the case of pressure, temperature, and precipitation, the total depth of snowfall, and the mean wet-bulb temperatures. The altitudes of the instruments above ground are also given.

Table II gives, for about 2,700 stations occupied by voluntary observers, the highest maximum and the lowest minimum temperatures, the mean temperature deduced from the average of all the daily maxima and minima, or other readings, as indicated by the numeral following the name of the station; the total monthly precipitation, and the total depth in inches of any snow that may have fallen. When the spaces in the snow column are left blank it indicates that no snow has fallen, but when it is possible that there may have been snow of which no record has been made, that fact is indicated by leaders, thus (. . . .).

Table III gives, for all stations that make observations at 8 a. m. and 8 p. m., the four component directions and the resultant directions based on these two observations only and without considering the velocity of the wind The total movement for the whole month, as read from the dial of the Robinson anemometer, is given for each station in Table I. By adding the four components for the stations comprised in any geographical division the average resultant direction for that division can be obtained.

Table IV gives the total number of stations in each State from which meteorological reports of any kind have been received, and the number of such stations reporting thunderstorms (T) and auroras (A) on each day of the current month.

Table V gives a record of rains whose intensity at some period of the storm's continuance equaled or exceeded the following rates:

Duration, minutes..	5	10	15	20	25	30	35	40	45	50	60	80	100	120
Rates pr. hr. (ins.)..	3.00	1.80	1.40	1.20	1.08	1.00	0.94	0.90	0.86	0.84	0.75	0.60	0.54	0.50

In the northern part of the United States, especially in the colder months of the year, rains of the intensities shown in the above table seldom occur. In all cases where no storm of sufficient intensity to entitle it to a place in the full table has occurred, the greatest rainfall of any single storm has been given, also the greatest hourly fall during that storm.

Table VI gives, for about 30 stations furnished by the Canadian Meteorological Service, Prof. R. F. Stupart, director, the means of pressure and temperature, total precipitation and depth of snowfall, and the respective departures from normal values, except in the case of snowfall.

Table VII gives the heights of rivers referred to zeros of gages.

NOTES EXPLANATORY OF THE CHARTS.

Chart I, tracks of centers of high areas, and Chart II, tracks of centers of low areas, are constructed in the same way. The roman numerals show number and chronological order of highs (Chart I) and lows (Chart II). The figures within the circles show the days of the month; the letters *a* and *p* indicate, respectively, the 8 a. m. and 8 p. m., seventy-fifth meridian time, observations. Within each circle is also given (Chart I) the highest barometric reading and (Chart II) the lowest pressure at or near the center at that time.

Chart III.—Total precipitation. The scale of shades showing the depth of rainfall is given on the chart itself. For isolated stations the rainfall is given in inches and tenths, when appreciable; otherwise, a "trace" is indicated by a capital T, and no rain at all, by 0.0.

Chart IV.—Sea-level pressure, temperature, and resultant surface winds. The wind directions on this Chart are the computed resultants of observations at 8 a. m. and 8 p. m., daily; the resultant duration is shown by figures attached to each arrow. The temperatures are the means of daily maxima and minima and are reduced to sea level. The pressures are the means of 8 a. m. and 8 p. m. observations, daily, and are reduced to sea level and to standard gravity. The reduction for 30 inches of the mercurial barometer, as formerly shown by the marginal figures for each degree of latitude, has already been applied.

Chart V.—Hydrographs for seven principal rivers of the United States.

Chart VI.—Surface temperatures; maximum, minimum, and mean. Lines of equal monthly mean temperature in red; lines of equal maximum temperature in black; and lines of equal minimum temperature (dotted) also in black.

Chart VII.—Percentage of sunshine. The average cloudiness at each Weather Bureau station is determined by numerous personal observations during the day. The difference between the observed cloudiness and 100, it is assumed, represents the percentage of sunshine, and the values thus obtained have been used in preparing Chart VII.

Chart VIII.—West Indian monthly isobars, isotherms, and resultant winds.

Chart IX.—Total snowfall.

TABLE I.—*Climatological data for Weather Bureau Stations, May*, 1901.

Stations.	Elevation of instruments.			Pressure, in inches.			Temperature of the air, in degrees Fahrenheit.										Mean wet thermometer.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.			Wind.					Clear days.	Partly cloudy days.	Cloudy days.	Average cloudiness, tenths.	Total snowfall.
	Barometer above sea level, feet.	Thermometers above ground.	Anemometer above ground.	Mean actual, 8 a. m. + 8 p. m. ÷ 2.	Mean reduced.	Departure from normal.	Mean max. + mean min. ÷ 2.	Departure from normal.	Maximum.	Date.	Mean maximum.	Minimum.	Date.	Mean minimum.	Greatest daily range.					Total.	Departure from normal.	Days with .01, or more.	Total movement, miles.	Prevailing direction.	Maximum velocity. Miles per hour.	Maximum velocity. Direction.	Maximum velocity. Date.					
New England.							52.1	— 1.5											82	5.56	+ 1.9										
Eastport	76	69	74	29.85	29.94	— .02	47.2	— 0.3	68	21	54	35	1	41	26	44	42	87	87	3.29	— 0.4	13	7,853	sw.	42	ne.	28	5	8	18	7.5	0.2
Portland, Me	103	81	117	29.78	29.88	— .09	51.6	— 2.0	81	23	58	37	6	45	27	47	44	79	79	7.17	+ 3.6	16	7,437	s.	38	nw.	3	9	13	6.3	
Northfield	876	15	65	28.96	29.89	— .08	53.1	— 0.6	86	22	63	29	6	43	42	49	45	77	77	3.91	+ 0.8	18	6,700	s.	42	nw.	3	3	14	14	7.1	
Boston	125	115	181	29.77	29.91	— .06	54.3	— 2.2	84	22	61	38	2	48	28	50	46	77	76	6.31	+ 2.7	15	8,294	ne.	36	ne.	24	7	10	14	6.5	
Nantucket	12	43	85	29.90	29.91	— .06	51.1	— 1.4	73	24	57	35	2	46	23	48	46	89	89	4.92	+ 1.4	14	10,373	sw.	47	e.	19	5	9	17	7.3	
Block Island	26	11	70	29.87	29.90	— .09	51.2	— 1.2	72	24	57	36	2	46	22	48	46	88	88	5.93	+ 2.2	16	11,989	sw.	55	e.	19	10	9	12	5.7	
Narragansett		10					52.8	— 1.8	77	24	60	35	27	45	26					6.55	+ 2.5	12		s.				16	3	12		
New Haven	106	117	140	29.78	29.89	— .10	55.2	— 2.4	80	23	63	39	6	48	30	51	47	79	79	6.38	+ 2.7	17	7,255	s.	35	w.	3	9	8	14	5.9	
Mid. Atlan. States.							60.3	— 1.3											74	4.52	+ 0.9										6.4	
Albany	97	84	113	29.78	29.89	— .08	59.0	— 0.3	80	7	67	41	6	51	32	53	48	72	72	4.79	+ 1.6	17	5,584	s.	30	n.	5	11	5	15	6.2	
Binghamton	875	79	90				57.0	+ 0.2	84	24	66	36	16	48	36					5.49	+ 1.4	19	4,593	w.	32	nw.	12	7	10	14	6.4	
New York	314	108	350	29.55	29.89	— .10	58.6	— 0.9	82	24	65	44	2	52	27	52	48	74	74	7.01	+ 3.8	17	9,742	ne.	62	nw.	3	8	8	15	6.3	
Harrisburg	374	94	104				60.8	+ 0.6	85	24	69	44	6	53	26					5.98	+ 1.3	16	5,094	e.	38	nw.	24	8	7	16	6.5	
Philadelphia	117	168	184	29.76	29.88	— .13	60.5	— 1.5	84	24	68	42	2	52	32	54	49	72	72	4.05	+ 0.8	16	8,066	ne.	36	nw.	3	7	4	20	7.1	
Scranton	805	111	119	29.02	29.89	— .09	58.4		86	24	67	38	14	50	35	52	46	68		5.58		20	5,523	ne.	30	n.	5	6	9	16	6.9	
Atlantic City	52	68	76	29.83	29.88	— .12	55.3	— 1.9	78	23	61	40	2	50	31	52	50	86		5.11	+ 2.3	13	8,219	sw.	42	nw.	3	6	12	13	6.4	
Cape May	17	47	51	29.88	29.90	— .10	56.0	— 2.6	76	5	61	41	2	51	28	53				4.62	+ 1.5	17	6,179	s.	30	nw.	3	8	10	13	6.3	
Baltimore	123	68	82	29.74	29.87	— .13	61.8	— 2.4	83	5	70	47	6	54	30	56	51	73	73	3.67	— 0.1	14	4,359	e.	24	se.	22	6	9	16	6.3	
Washington	112	59	76	29.75	29.87	— .14	62.5	— 1.4	84	24	72	42	14	53	34	57	53	75	75	2.81	— 1.1	13	4,926	nw.	28	nw.	3	10	5	16	6.3	
Cape Henry		5	33				62.2	— 2.3	86	1	69	45	2	55	34					3.45	— 0.6	17	8,440	se.	36	ne.	25	2	16	13	6.9	
Lynchburg	681	83	88	29.13	29.84	— .15	64.9	— 1.1	90	2	75	42	4	54	43	58	52	69		5.34	+ 1.4	14	2,872	ne.	24	nw.	1	9	11	11	5.8	
Norfolk	91	102	111	29.77	29.87	— .13	64.5	— 1.9	87	1	73	46	2	56	36	59	55	78		2.59	— 1.7	16	6,817	se.	36	n.	1	6	11	14	6.3	
Richmond	144	82	90				65.5		88	1	75	50	7	56	36					3.80		19	3,791	ne.	28	s.	22	5	12	14	6.4	
S. Atlantic States.							70.2	0.0											76	6.35	+ 2.4										5.2
Charlotte	773	68	76	29.03	29.83	— .16	68.8	+ 0.4	91	3	79	49	29	59	30	60	55	68		8.00	+ 3.7	13	4,630	e.	32	sw.	12	7	13	11	5.8	
Hatteras	11	17	36	29.85	29.86	— .14	65.4	— 1.0	79	26	71	49	1	60	23	62	61	88		3.99	— 0.6	13	8,484	sw.	39	w.	8	11	9	11	5.2	
Kittyhawk	8	12	30				62.6	— 3.4	82	25	69	48	1	56	30					2.26	+ 5.5	11	9,073	ne.				12	10	9	5.3	
Raleigh	376	93	101	29.47	29.87	— .12	68.2	+ 0.7	90	3	78	53	10	58	36	61	56	74		9.90	+ 5.5	17	4,547	sw.	27	se.	21	11	6	14	5.9	
Wilmington	78	82	90	29.78	29.86	— .13	70.4	+ 0.7	94	3	79	52	1	62	31	64	62	82		6.18	+ 2.0	15	6,204	sw.	35	e.	3	7	18	6	4.9	
Charleston	48	14	92	29.82	29.87	— .13	72.9	+ 0.5	94	3	80	57	1	66	27	66	63	77		4.30	+ 0.3	11	7,374	s.	44	se.	21	9	19	3	4.5	
Columbia		5					72.0	— 0.4	92	3	83	50	28	61	40					8.52	+ 4.7	12		sw.				6	19	6	5.5	
Augusta	180	89	103	29.65	29.84	— .13	72.4	+ 0.4	91	2	83	51	28	62	36	63	59	69		5.29	+ 1.8	12	4,378	w.	38	n.	19	10	15	6	4.6	
Savannah	65	79	89	29.79	29.85	— .16	74.0	+ 1.1	94	3	83	55	28	65	30	66	63	77		2.71	— 0.2	12	5,959	w.	35	n.	19	13	15	3	4.5	
Jacksonville	43	69	84	29.84	29.89	— .09	75.4	+ 0.5	93	3	85	55	1	66	30	66	63	74		5.31	+ 1.3	12	6,380	sw.	35	w.	13	9	17	5	5.1	
Florida Peninsula.							76.2	— 0.9											75	3.56	— 0.4										4.0
Jupiter	28	13	55	29.87	29.90	— .07	75.8	+ 0.1	92	6	84	61	28	67	27	70	67	77		3.63	— 2.2	7	5,935	w.	36	se.	21	15	11	5	4.3	
Key West	22	43	50	29.89	29.91	— .05	77.1	— 2.3	86	24	82	67	9	73	14	71	69	75		2.74	— 0.4	5	4,901	n.	31	nw.	9	17	10	4	3.5	
Tampa	34	60	67	29.86	29.90	— .08	75.6	— 0.4	90	24	84	57	1	67	26	68	64	73		4.31	+ 1.4	7	4,832	w.	34	sw.	20	14	11	6	4.3	
East Gulf States.							72.3	— 0.4											67	5.19	+ 0.8										4.2	
Atlanta	1,174	139	156	28.64	29.86	— .16	69.4	+ 0.6	89	24	79	47	28	60	26	59	55	64		7.55	+ 4.4	9	6,764	nw.	47	nw.	12	10	15	6	4.5	
Macon	370	93	99				71.6		92	3	83	50	28	60	26					2.85		11	3,984	nw.	40	nw.	19	10	9	12	5.4	
Pensacola	56	78	90				73.4	— 0.1	89	2	81	52	27	66	24					5.50	+ 2.2	5	7,781	nw.	48	nw.	20	17	11	3	3.4	
Mobile	57	88	96	29.83	29.89	— .08	73.5	— 0.1	90	11	83	50	27	64	26	65	60	69		2.85	— 1.5	7	5,643	sw.	32	nw.	25	14	14	3	3.8	
Montgomery	223	100	112	29.63	29.86	— .13	72.8	0.0	92	25	84	49	27	62	33	62	56	64		5.21	+ 1.2	8	4,765	w.	29	n.	12	15	10	6	4.3	
Meridian	375	84	93				69.5	— 0.9	90	24	82	46	27	58	38					4.35	— 1.5	9	3,709	sw.	44	nw.	31	13	15	3	3.9	
Vicksburg	247	65	76	29.61	29.87	— .10	71.5	— 1.1	90	1	81	52	27	62	28	63	58	68		9.77	+ 4.8	8	4,398	sw.	31	nw.	31	9	12	10	5.1	
New Orleans	51	88	121	29.84	29.90	— .05	75.2	+ 0.6	89	15	84	58	27	66	24	65	61	68		1.08	— 3.8	5	5,592	sw.	26	n.	26	17	12	2	3.4	
Port Eads		47					72.8	— 1.8	85	25	80	60	*	66	19					0.73	— 2.5	4		sw.					5	24	2		
West Gulf States.							72.5	— 0.1											73	2.36	— 2.1										4.6
Shreveport	249	77	84	29.61	29.87	— .08	71.7	— 1.4	90	10	82	50	27	62	31	63	59	69		4.30	+ 0.1	11	4,901	se.	27	se.	31	12	6	13	5.2	
Fort Smith	457	79	94	29.38	29.86	— .05	69.4	+ 1.2	89	24	80	46	27	59	31	64	62	82		2.52	— 2.2	9	5,814	e.	37	w.	16	7	23	1	4.0	
Little Rock	357	93	100	29.50	29.88	— .07	68.8	— 0.5	90	1	78	48	26	60	31	62	58	72		2.45	— 3.3	8	5,353	nw.	40	nw.	24	11	14	6	4.5	
Corpus Christi	18	42	50	29.83	29.85	— .08	75.0	— 0.4	95	31	80	60	27	70	20	70	67	80		1.39	— 1.9	4	10,632	se.	48	ne.	20	13	12	6	4.3	
Fort Worth	670	106	114	29.14	29.84	— .06	71.5		95	10	82	47	27	61	36	62	57	67		4.50		11	8,438	s.	58	w.	16	11	14	6	4.6	
Galveston	54	106	112	29.81	29.86	— .08	74.6	— 1.2	85	1	79	62	26	70	20	68	66	80		0.46	— 3.4	4	8,843	se.	38	n.	26	13	10	8	4.7	
Palestine	510	73	79	29.34	29.88	— .07	71.4	+ 0.1	88	10	81	50	27	61	31	64	60	71		2.92	— 2.9	8	5,233	s.	48	nw.	31	11	10	10	5.1	
San Antonio	701	67	77	29.12	29.84	— .07	76.4	+ 1.5	96	*	88	52	27	64	32	65	60	66		2.47	— 0.8	9	6,259	se.	39	nw.	6	10	15	6	4.6	
Ohio Val. & Tenn.							63.9	— 1.3											67	3.61	— 0.2										5.3
Chattanooga	762	106	112	29.08	29.88	— .11	67.1	— 0.6	89	2	78	50	28	56	33	58	52	65		6.08	+ 2.2	11	4,868	sw.	33	nw.	24	10	13	8	5.3	
Knoxville	1,004	10	88	28.81	29.87	— .14	65.6	— 0.6	89	3	77	44	28	54	34	57	52	69		4.03	+ 0.1	12	4,572	sw.	30	nw.	24	12	10	9	4.8	
Memphis	397	140	154	29.47	29.90	— .06	68.7	— 1.5	92	1	77	48	26	60	25	60	54	64		2.00	— 2.5	10	6,044	nw.	47	w.	24	9	10	12	5.8	
Nashville	546	128	134	29.31	29.89	— .08	66.3	— 2.0	90	2	76	45	27	56	32	57	51	64		4.11	+ 0.5	12	3,890	nw.	30	nw.	24	12	8	11	5.1	
Lexington	989	75	102				62.8	— 0.8	87	5	72	45	27	54	38					2.67	— 0.8	12	5,841	nw.	37	nw	24	14	10	7	4.6	
Louisville	525	114	136	29.31	29.88	— .09	64.4	— 1.7	90	2	74	45	18	55	31	56	50	65		2.45	— 1.3	11	5,205	sw.	31	sw.	24	11	9	11	5.4	
Evansville	434	72	82				64.8		89	1	74	45	18	56	31					1.00		9	3,988	sw.	30	w.	5	17	8	6	3.7	
Indianapolis	822	154	164	29.00	29.87	— .11	60.2	— 3.0	86	2	69	41	13	52	29	53	48	68		2.45	— 1.7	11	6,312	n.	32	sw.	12	8	11	12	6.0	
Cincinnati	628	152	157	29.20	29.87	— .10	62.5	— 2.2	88	2	71	42	13	54	31	55	49	67		1.62	— 1.8	15	5,074	nw.	29	w.	12	9	10	12	5.6	
Columbus	824	87	100	29.00	29.87	— .10	61.1	— 0.9	86	2	71	40	13	51	35	53	47	68		4.24	0.0	16	4,948	sw.	31	sw.	12	5	9	17	6.8	
Pittsburg	842	116	123	28.96	29.85	— .14	62.0	— 0.2	86	24	71	42	13	55	34	54	48	68		5.80	+ 2.4	18	4,187	nw.	26	s.	21	10	17	4	4.5	
Parkersburg	638	77	84	29.21	29.89	— .09	62.6	— 0.4	88	24	73	43	30	52	37	56	52	74		4.28	+ 0.3	14	3,671	w.	35	nw.	24	10	13	8	5.2	
Elkins	1,940	41	50	27.84	29.88	— .11	57.4		84	24	70	30	4	45	49	52	48	75		5.95		19	3,109	n.	27	se.	21	7	13	11	6.1	
Lower Lake Region.							55.7	— 1.0											76	2.96	— 0.5										6.2
Buffalo	767	178	206	29.05	29.88	— .09	54.2	+ 0.2	79	21	61	40	3	48	28	49	45	74		3.38	— 0.2	16	8,998	sw.	46	sw.	12	7	8	16	6.8	
Oswego	335	76	87	29.51	29.87	— .12	54.0	0.0	76	8	61	39	3	47	24	49	45	75		3.48	+ 0.6	20	6,358	se.	25	n.	2	6	8	17	6.7	
Rochester	523	81	90	29.31	29.88	— .09	56.2	— 0.1	79	8	64	39	4	48	30	51	48	79		3.06	— 0.3	18	5,811	ne.	33	w.	2	8	10	13	6.2	
Erie	713	92	102	29.11	29.87	— .10	55.0	— 1.7	78	21	62	38	15	48	31	52	51	88		2.24	— 1.6	13	6,934	ne.	33	ne.	24	7	8	16	6.7	T.
Cleveland	762	190	201	29.06	29.87	— .12	55.8	— 1.9	82	2	63	39	13	49	31	51	46	74		2.78	— 0.8	14	9,184	n.	48	se.	21	9	12	10	5.5	
Sandusky	629	62	70	29.20	29.87	— .12	56.9	— 1.6	84	2	64	37	13	50	31	52	48	78		3.19	— 0.3	16	6,097	ne.	40	w.	12	5	16	10	6.1	
Toledo	628	128	127	29.20	29.88	— .09	57.2	— 2.2	86	2	66	36	13	49	31	51	46	70		2.85	— 0.5	14	6,933	ne.	34	w.	12	6	14	11	5.8	
Detroit	730	160	190	29.09	29.87	— .11	56.6	— 0.9	85	2	65	36	13	49	33	50	46	72		2.76	— 0.8	13	8,214	ne.	40	w.	12	5	16	10	6.0	
Upper Lake Region.							52.2	+ 0.3											76	2.35	— 1.4										6.1
Alpena	609	63	80	29.25	29.91	— .06	50.6	+ 1.6	68	22	59	33	15	42	27	48	45	81		2.70	— 0.8	15	7,144	ne.	33	ne.	24	6	7	18	6.8	
Escanaba	612	43	57	29.28	29.94	— .02	50.8	+ 1.5	74	7	59	32	14	43	26	47	43	75		2.26	— 1.1	11	7,071	n.	37	n.	31	8	7	16	6.3	
Grand Haven	632	55	92	29.20	29.88	— .07	54.6	+ 0.2	81	5	63	34	15	46	30	49	45	75		1.62	— 1.8	11	7,134	ne.	33	sw.	23	7	8	16	6.4	
Houghton	668	66	74				51.8		81	5	63	34	14	41	41					1.39		5	5,643	e.	26	n.	7	12	12	7	4.8	
Marquette	734	79	116	29.17	29.96	— .02	49.2	+ 0.2	74	16	56	36	14	43	26	45	42	79		4.81	— 1.9	12	6,812	nw.	32	nw.	31	10	10	11	5.6	0.1
Port Huron	638	70	130	29.21	29.90	— .07	52.6	— 0.6	82	2	61	32	4	44	39	48	44	78		2.95	— 0.4	16	8,029	ne.	44	w.	12	6	11	14	6.6	
Sault Ste. Marie	614	40	61	29.25	29.91	— .04	51.9	+ 4.1	78	5	62	31	15	42	39	47	42	71		1.55	— 0.7	10	6,330	nw.	30	nw.	12	8	13	10	5.6	
Chicago	823	241	274	29.02	29.90	— .06	54.1	— 2.0	87	2	61	41	24	47	43	50	47	83		2.18	— 1.5	13	11,825	ne.	48	ne.	24	9	11	11	5.9	
Milwaukee	681	134	142	29.19	29.92	— .05	53.7	+ 0.8	86	2	62	40	26	45	40	47	42	73		1.75	— 1.8	13	8,549	ne.	43	ne.	24	4	8	19	7.2	T.
Green Bay	617	49	57	29.26	29.93	— .05	54.8	+ 0.9	80	16	64	36	12	46	36	49	44	70		2.71	— 1.1	12	6,348	n.	36	n.	24	6	7	18	6.8	
Duluth	702	95	115	29.21	29.97	+ .01	49.8	+ 1.8	82	16	58	34	12	42	36	45	40	72		0.97	— 2.7	9	7,409	ne.	43	ne.	23	12	14	5	4.8	T.
North Dakota.							61.4	+ 7.9											57	0.80	— 1.8										3.1
Moorhead	935	54	60	28.95	29.95	+ .02	59.3	+ 6.1	94	1	72	31	12	46	42	51	45	63		0.76	— 1.7	6	8,023	se.	30	ne.	23	19	6	6	3.5	
Bismarck	1,674	16	29	28.19	29.94	+ .05	61.0	+ 6.8	91	17	75	26	12	47	42	51	43	56		0.04	— 2.4	1	8,314	se.	44	nw.	10	23	5	3	2.7	
Williston	1,875	15	31	27.93	29.87	— .02	64.0	+10.8	98	17	79	25	12	50	46	52	43	53		0.71	— 1.4	6	9,092	s.	48	nw.	10	26	3	2	3.2	

TABLE I.—*Climatological data for Weather Bureau Stations, May, 1901*—Continued.

Stations	Elevation of instruments: Barometer above sea level, feet.	Elevation of instruments: Thermometers above ground.	Elevation of instruments: Anemometer above ground.	Pressure, in inches: Mean actual, 8 a. m. + 8 p. m. + 2.	Pressure, in inches: Mean reduced.	Pressure, in inches: Departure from normal.	Temperature of the air, in degrees Fahrenheit: Mean max. + mean min. + 2.	Temperature: Departure from normal.	Temperature: Maximum.	Temperature: Date.	Temperature: Mean maximum.	Temperature: Minimum.	Temperature: Date.	Temperature: Mean minimum.	Temperature: Greatest daily range.	Mean wet thermometer.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches: Total.	Precipitation: Departure from normal.	Precipitation: Days with .01, or more.	Wind: Total movement, miles.	Wind: Prevailing direction.	Wind: Maximum velocity: Miles per hour.	Wind: Maximum velocity: Direction.	Wind: Maximum velocity: Date.	Clear days.	Partly cloudy days.	Cloudy days.	Average cloudiness, tenths.	Total snowfall
Upper Mis. Valley.							62.2	+ 0.8										63	2.10	− 2.1									4.7	
Minneapolis	.....	99	208	.....	.....	.....	59.4	+ 2.5	80	1	70	33	25	49	35	...	...	....	1.57	− 2.1	9	8,526	ne.	29	ne.	24	10	14	7	....	
St. Paul	837	114	124	29.02	29.92	− .01	60.2	+ 2.7	90	1	70	35	25	50	31	51	43	60	1.64	− 1.8	7	5,584	ne.	30	nw.	11	13	10	8	4.5	
La Crosse	714	70	78	.....	.....	.....	61.2	+ 1.8	88	2	72	36	12	50	33	...	...	...	3.85	+ 0.6	10	4,859	n.	30	nw.	11	11	14	6	4.9	
Davenport	606	71	79	29.23	29.88	− .08	61.3	+ 0.6	88	2	71	40	26	51	30	53	47	64	1.37	− 3.0	9	5,722	e.	36	w.	11	14	9	8	4.5	
Des Moines	861	84	88	29.00	29.92	− .01	61.6	+ 1.2	88	18	73	36	13	51	33	54	48	64	1.40	− 3.3	5	5,668	ne.	29	nw.	11	12	13	6	4.8	
Dubuque	698	101	109	29.16	29.90	− .05	60.2	+ 0.3	88	2	70	38	26	50	37	52	45	61	3.10	− 0.9	12	5,968	nw.	37	nw.	12	7	15	9	5.4	
Keokuk	614	63	78	29.23	29.88	− .06	63.0	+ 0.4	87	*	73	40	*	53	31	57	53	74	1.95	− 2.1	5	5,631	n.	28	sw.	23	17	9	5	3.8	
Cairo	356	87	93	29.50	29.89	− .05	66.0	− 1.1	89	1	75	45	26	57	29	58	54	70	2.00	− 1.8	10	5,163	ne.	36	w.	5	6	15	10	5.7	
Springfield, Ill	644	82	93	29.20	29.88	− .09	62.3	− 0.1	89	23	73	40	26	52	34	53	46	62	1.88	− 3.1	9	6,753	ne.	48	sw.	23	13	11	7	4.7	
Hannibal	534	75	110	.....	.....	.....	63.3	+ 0.2	87	2	74	38	13	53	32	...	...	...	1.65	− 3.2	8	6,924	e.	30	sw.	5	17	7	7	4.1	
St. Louis	567	111	210	29.28	29.88	− .06	66.2	+ 0.4	90	2	75	46	26	57	28	57	52	64	2.69	− 1.9	12	7,381	w.	39	w.	23	11	11	9	4.9	
Missouri Valley.							62.3	+ 2.2										60	1.65	− 2.6									4.2	
Columbia	784	4	84	.....	.....	.....	63.5	− 1.0	89	18	76	34	13	51	40	...	...	...	0.35	− 5.5	4	5,908	n.	29	sw.	5	12	10	9	5.0	
Kansas City	963	78	95	28.90	29.91	− .01	63.8	− 0.4	86	2	72	43	26	55	28	55	48	61	0.75	− 3.9	8	5,858	n.	29	se.	4	14	7	10	4.5	
Springfield, Mo	1,324	100	103	28.50	29.88	− .06	63.8	+ 0.6	84	2	73	38	26	54	27	56	49	64	3.04	− 3.0	4	7,160	n.	30	sw.	5	17	12	2	3.7	
Topeka	.....	81	.....	.....	.....	.....	63.5	+ 0.1	86	2	74	40	26	53	33	...	...	...	0.54	− 5.0	6	.....	ne.	....	.....	...	10	17	4	4.4	
Lincoln	1,189	75	84	28.63	29.89	− .04	61.4	+ 0.3	87	2	72	38	26	51	34	53	46	63	1.96	− 2.3	6	7,916	ne.	45	sw.	4	13	8	10	5.0	
Omaha	1,105	115	121	28.73	29.89	− .03	62.6	+ 0.9	87	2	72	42	12	53	29	54	48	65	2.13	− 2.2	7	6,714	n.	36	n.	10	13	8	10	4.9	
Valentine	2,598	39	40	27.22	29.90	− .01	60.6	+ 4.8	88	1	74	32	7	48	45	50	42	56	0.90	− 1.9	5	7,412	se.	45	nw.	10	18	9	4	3.2	
Sioux City	1,135	96	164	.....	.....	.....	60.8	+ 2.4	87	1	71	36	12	50	33	...	...	...	3.65	+ 0.2	10	9,012	se.	48	nw.	10	14	10	7	4.3	
Pierre	1,572	43	50	28.25	29.89	.00	64.8	+ 9.2	94	1	78	32	12	51	46	52	42	50	0.63	− 1.7	6	6,937	se.	38	nw.	10	21	4	6	3.2	
Huron	1,306	56	67	28.55	29.94	+ .01	59.6	+ 4.5	89	1	73	28	12	46	39	52	45	63	1.78	− 1.2	11	8,635	se.	38	nw.	10	16	12	3	3.6	
Yankton	1,233	52	58	.....	.....	.....	61.4	+ 2.9	88	2	73	35	25	50	31	...	...	...	2.45	− 1.9	11	5,765	e.	42	n.	10	18	7	6	4.0	
Northern Slope.							59.3	+ 5.9										64	2.71	+ 0.3									4.8	
Havre	2,505	46	47	27.27	29.87	− .04	58.8	+ 5.5	91	16	71	32	9	47	39	51	46	68	3.50	+ 2.0	8	6,766	sw.	39	ne.	9	10	14	7	5.3	0.8
Miles City	2,371	42	50	27.34	29.77	− .14	67.6	+11.2	100	17	82	32	11	53	46	60	56	73	1.40	− 0.9	10	4,399	se.	48	e.	2	18	12	1	3.5	
Helena	4,110	88	93	25.75	29.90	− .03	56.1	+ 4.3	86	16	67	30	10	45	35	47	40	61	4.11	+ 2.5	12	5,393	sw.	45	sw.	18	2	16	13	7.0	
Kalispell	2,965	45	51	26.86	29.92	.00	54.6	.....	84	27	66	26	10	43	37	47	40	65	1.95	.....	11	4,478	se.	30	se.	27	10	12	9	4.9	
Rapid City	3,234	46	50	26.54	29.82	− .08	60.8	+ 7.9	89	1	73	33	11	48	36	50	41	53	2.53	− 1.1	8	6,806	se.	36	nw.	10	18	9	4	3.7	
Cheyenne	6,088	56	64	23.97	29.89	− .01	53.7	+ 3.1	77	1	66	31	11	41	37	45	38	62	2.47	+ 0.2	12	7,386	s.	41	s.	30	10	14	7	5.0	T.
Lander	5,372	28	36	24.58	29.88	− .03	57.2	+ 6.2	86	18	70	36	11	44	42	48	42	64	3.13	+ 0.4	14	3,495	sw.	30	se.	28	5	19	7	5.6	
North Platte	2,821	43	52	27.02	29.91	+ .01	61.0	+ 2.8	87	1	73	38	8	49	39	52	46	68	1.83	− 0.9	8	6,573	se.	38	s.	3	16	11	4	3.8	
Middle Slope.							62.7	+ 0.7										62	2.37	− 1.2									4.6	
Denver	5,291	79	151	24.67	29.90	.00	59.6	+ 3.2	81	21	72	38	7	47	32	48	40	57	1.18	− 1.6	9	6,025	s.	50	s	2	7	16	8	5.4	
Pueblo	4,685	80	86	25.22	29.87	+ .01	59.4	+ 0.7	82	1	72	39	7	47	36	49	43	63	3.41	+ 1.6	13	5,298	se.	38	nw.	28	9	16	8	4.9	
Concordia	1,398	42	47	28.44	29.91	− .02	62.2	+ 0.1	84	28	74	38	13	50	37	54	48	65	2.86	− 1.4	10	5,080	n.	25	se.	4	13	11	7	4.7	
Wichita	1,358	78	85	28.49	29.91	+ .03	65.4	+ 1.2	86	2	77	40	26	53	36	55	48	60	1.40	− 2.6	8	5,808	n.	32	n.	10	16	11	4	3.4	
Oklahoma	1,214	54	62	28.59	29.86	− .01	67.4	− 0.4	93	10	78	45	26	56	35	57	50	61	3.64	− 1.7	11	6,861	s.	30	s.	22	13	8	10	5.2	
Southern Slope.							66.2	− 2.0										64	6.58	+ 3.8									4.6	
Abilene	1,738	45	54	28.05	29.84	− .05	70.8	− 1.4	96	10	82	47	27	60	32	60	54	63	7.17	+ 3.6	10	6,675	se.	36	nw.	30	11	10	10	4.9	
Amarillo	3,676	54	61	26.17	29.88	.00	61.6	− 2.6	85	12	72	39	3	51	30	53	47	66	5.99	+ 4.0	10	9,967	se.	51	sw.	2	15	10	6	4.2	
Southern Plateau.							65.2	− 1.3										36	0.82	+ 0.2									2.6	
El Paso	3,762	10	110	26.05	29.78	− .03	72.6	+ 0.3	95	19	86	49	3	59	38	51	30	27	0.05	− 0.4	1	10,350	nw.	72	ne.	31	21	10	0	2.4	
Santa Fe	7,013	47	50	21.21	29.86	− .02	55.7	0.0	79	19	67	32	3	45	29	45	36	54	2.12	+ 1.1	19	5,849	se.	29	s.	2	14	13	4	4.1	0.8
Flagstaff	6,907	12	25	23.28	29.97	.....	50.7	− 3.6	72	18	65	22	22	36	44	44	...	....	2.27	+ 0.5	7	.....	sw.	....	.....	..	8	13	10	...	7.7
Phoenix	1,108	47	57	28.63	29.77	− .05	75.0	+ 0.7	98	18	90	50	3	60	39	54	37	30	0.10	− 0.1	2	3,736	e.	23	se.	26	18	11	2	2.8	
Yuma	141	16	50	29.61	29.75	− .06	74.4	− 2.7	100	17	90	49	3	59	39	57	42	39	T.	0.0	0	5,293	sw.	33	w.	1	27	3	1	0.9	
Independence	3,910	51	58	25.85	29.77	− .11	62.8	− 2.6	88	16	76	34	2	50	32	47	28	32	0.36	+ 0.1	3	6,692	nw.	40	n.	23	18	13	0	2.8	
Middle Plateau.							59.1	+ 2.0										42	1.98	+ 1.0									4.7	
Carson City	4,720	82	92	25.19	29.93	+ .02	53.4	− 0.8	79	10	67	30	22	40	36	44	36	58	1.61	+ 1.0	5	4,945	w.	36	sw.	18	15	9	7	4.3	
Winnemucca	4,344	59	70	25.58	29.90	− .01	55.2	+ 0.8	82	16	70	29	22	40	43	44	33	48	0.73	− 0.2	5	6,503	sw.	36	w.	27	9	5	17	6.5	
Modena	5,479	10	38	24.51	29.91	+ .01	56.2	.....	82	16	72	28	20	40	46	43	30	43	0.65	.....	5	.	w.	....	.....	..	12	6	13	....	
Salt Lake City	4,366	105	110	25.49	29.82	− .09	63.0	+ 5.2	88	17	74	43	*	52	37	49	38	44	4.27	+ 2.6	7	5,456	se.	45	w.	1	20	9	2	2.9	
Grand Junction	4,608	43	50	25.25	29.81	− .09	64.8	+ 2.7	91	19	79	37	3	51	41	50	39	47	1.29	+ 0.7	6	4,221	se.	39	sw.	21	8	18	5	5.1	
Northern Plateau.							59.8	+ 2.2										59	1.00	− 0.6									5.7	
Baker City	3,471	53	58	26.38	29.94	− .01	55.5	+ 2.8	80	16	67	32	30	44	33	46	32	60	1.03	− 0.9	10	4,820	nw.	26	s.	26	3	8	20	7.3	
Boise	2,739	61	68	27.06	29.87	− .07	61.7	+ 3.6	92	16	76	38	30	48	40	49	38	52	0.38	− 1.2	5	3,854	nw.	35	ne.	28	5	17	9	5.7	
Lewiston	770	52	61	.....	.....	.....	63.4	.....	92	25	76	38	10	51	40	...	...	...	1.10	.....	10	2,804	e.	24	nw.	30	9	11	11	5.9	
Pocatello	4,482	48	56	25.37	29.85	− .07	59.0	+ 4.7	84	17	72	32	20	46	46	47	39	55	0.81	− 0.4	7	7,259	w.	48	n.	30	15	9	7	4.5	
Spokane	1,943	99	107	27.91	29.94	− .01	57.9	+ 0.9	86	26	69	33	10	47	36	49	41	59	1.26	− 0.1	11	4,489	sw.	24	sw.	7	4	15	12	6.2	
Walla Walla	1,000	65	73	28.88	29.94	.00	60.1	− 0.8	85	*	71	35	20	49	35	53	48	67	1.52	− 0.2	9	4,120	s.	24	sw.	7	13	16	2	4.5	
N. Pac. Coast Reg.							53.1	− 1.3										76	3.36	+ 0.4									6.6	
Neah Bay	50	7	52	29.97	30.03	+ .01	49.0	− 3.5	67	25	54	36	9	44	20	47	45	88	10.06	+ 4.8	23	4,771	w.	30	w.	28	6	9	16	6.9	
Port Crescent	259	14	20	.....	.....	.....	48.8	− 1.6	80	25	56	32	6	41	26	....	....	....	2.12	− 0.4	18	3,623	w.	16	w.	1	6	13	12	6.2	
Seattle	123	114	121	29.91	30.04	+ .04	55.4	+ 0.1	82	25	63	39	19	48	27	49	44	70	1.44	− 0.9	17	4,022	se.	22	n.	20	7	15	9	5.7	
Tacoma	213	113	120	.....	.....	.....	53.4	− 0.7	82	26	62	37	6	45	29	....	....	....	2.26	− 0.2	15	4,025	sw.	19	n.	21	4	16	11	6.3	
Astoria	20	57	64	.....	.....	.....	51.8	− 2.6	78	25	58	39	6	46	28	....	....	....	3.23	− 0.6	17	.....	sw.	....	.....	...	6	10	15	6.6	
Portland, Oreg	154	203	213	29.85	30.01	− .04	56.7	− 0.6	87	25	65	41	22	48	28	51	46	72	2.41	0.0	13	6,123	nw.	30	s.	19	3	9	19	7.5	
Roseburg	518	56	67	29.44	30.00	− .05	56.5	− 0.4	82	31	66	37	6	47	41	51	46	74	1.97	0.0	15	2,821	nw.	27	sw.	18	4	12	15	6.9	
Mid. Pac. C'st Reg.							50.9	− 1.5										72	0.90	− 0.7									4.4	
Eureka	62	60	69	29.98	30.04	+ .01	52.2	− 0.5	63	16	56	44	31	48	15	49	46	83	1.50	− 1.6	12	5,188	nw.	39	n.	24	8	11	12	5.9	
Mount Tamalpais	2,375	11	18	27.49	29.98	− .01	53.8	.....	80	31	60	38	19	47	20	46	40	67	1.01	.....	3	14,940	nw.	71	nw.	17	22	7	2	2.6	
Red Bluff	332	50	56	29.56	29.91	− .02	66.5	− 0.5	95	31	78	42	21	55	32	55	46	56	0.41	− 0.9	6	3,970	se.	35	n.	24	18	12	1	3.0	
Sacramento	69	106	117	29.84	29.92	− .02	61.4	− 2.1	93	31	73	44	19	50	33	51	49	69	0.80	− 0.2	6	6,286	sw.	27	sw.	18	16	9	6	4.2	
San Francisco	155	161	167	29.83	29.99	+ .01	53.9	− 2.7	81	31	60	46	6	48	28	51	48	84	0.69	− 0.1	4	9,292	w	34	w.	17	10	18	3	4.5	
Point Reyes Light	.....	12	16	.....	.....	.....	50.6	− 1.6	67	26	56	44	7	46	20	....	....	....	1.08	− 0.9	3	19,248	nw.	68	nw.	23	10	9	12	5.9	
S. Pac. Coast Reg.							61.0	− 1.4										72	0.86	+ 0.5									4.8	
Fresno	330	67	70	29.54	29.89	− .01	65.7	− 2.3	93	31	79	44	26	52	36	54	44	55	0.50	+ 0.1	3	5,723	nw.	24	w.	20	21	4	6	2.9	
Los Angeles	338	74	82	29.56	29.91	− .02	60.4	− 1.7	76	22	69	47	26	52	26	55	52	81	1.50	+ 1.1	5	3,442	w.	17	e.	25	5	21	5	5.1	
San Diego	87	94	102	29.83	29.93	− .02	60.0	− 0.4	67	22	63	51	26	57	14	55	51	75	0.77	+ 0.4	7	4,670	w.	24	s.	23	8	11	12	6.2	
San Luis Obispo	201	10	46	29.76	29.98	+ .04	57.9	− 1.1	76	31	68	41	26	48	29	51	48	77	0.69	+ 0.4	4	4,527	w.	25	w.	23	10	12	9	5.1	
West Indies.																														
Basseterre	29	41	54	29.93	29.96	.....	80.7	.....	87	3	85	69	22	76	15	74	72	75	1.17	. .....	14	6,590	e.	24	e.	22	3	24	4	5.5	
Bridgetown	30	57	65	29.91	29.94	.....	80.8	.....	88	20	87	72	4	75	15	75	72	73	1.45	− 1.6	13	6,888	e.	25	e.	10	11	10	10	5.2	
Cienfuegos	52	62	67	.....	.....	.....	.....	.....	...	...	...	...	...	...	...	...	...	...	.....	.....	...	.....	.....	.....	.....	...	...	...	...	.....	
Grand Turk	11	6	20	.....	.....	.....	80.6	.....	91	27	86	63	5	75	18	....	....	....	0.98	.....	5	... ...	e.	....	.....	...	0	23	8	6.1	
Havana	57	87	105	29.86	29.92	.....	76.0	.....	90	8	83	59	1	69	20	71	69	80	10.10	+ 5.6	10	6,455	e.	34	sw.	9	17	11	3	3.5	
Kingston	286	38	52	29.61	29.91	.....	79.4	.....	91	31	87	69	6	72	20	72	69	71	0.54	.....	10	5,311	se.	32	se.	27	5	22	4	5.3	
Port of Spain	40	65	66	29.88	29.92	.....	80.1	... ...	91	8	87	71	31	73	20	73	71	74	6.15	.....	14	3,770	e.	19	e.	31	3	9	19	7.5	
Puerto Principe	352	55	62	29.60	29.94	.....	78.8	.....	96	8	91	56	1	67	35	71	68	77	6.50	.....	15	4,409	ne.	33	n.	12	10	15	6	4.6	
Roseau	25	37	47	29.91	29.93	.....	81.2	.....	91	27	88	72	6	74	18	72	69	67	1.61	.....	15	3,925	e.	23	se.	26	11	15	5	4.4	
San Juan	82	48	90	29.87	29.95	.....	80.2	.....	93	2	86	70	25	74	18	75	72	78	4.84	+ 0.2	18	6,369	se.	32	ne.	25	8	20	3	4.9	
Santiago de Cuba	82	26	31	29.83	29.91	.....	79.8	.....	91	31	88	65	2	71	25	72	69	74	5.19	.....	10	2,841	s.	20	ne.	15	14	15	2	4.8	
Santo Domingo	57	37	44	.....	.....	.....	.....	.....	...	...	...	...	...	...	...	...	...	...	.....	.....	...	.....	.....	.....	.....	...	...	...	...	.....	
Willemstad	75	39	46	29.79	29.86	.....	82.5	.....	90	31	87	75	18	78	11	76	74	80	0.11	.....	2	9,254	e.	24	e.	31	4	23	4	5.5	

NOTE.—The data at stations having no departures are not used in computing the district averages. *More than one date.

TABLE II.—*Climatological record of voluntary and other cooperating observers, May, 1901.*

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Alabama.	°	°	°	*Ins.*	*Ins.*
Ashville	89	47	67.7	5.65	
Benton				5.61	
Bermuda	99	46	73.0	2.73	
Birmingham	92	45	69.8	4.51	
Bridgeport				4.43	
Burkville				5.12	
Calera				4.45	
Camp Hill	95	46	71.4	5.96	
Citronelle	92	49	74.1	3.81	
Clanton	87	48	69.2	5.86	
Daphne	91[b]	50[c]	73.6[c]	2.32	
Decatur	92	45	68.4	3.63	
Demopolis				5.47	
Eufaula[a]	95	50	73.2	5.73	
Eutaw	92	47	71.0	5.59	
Evergreen	95	48	72.6	4.47	
Florence[a]				2.31	
Florence[b]	92	41	67.1	2.32	
Fort Deposit	96	47	72.4	5.65	
Gadsden	94	47	69.1	5.23	
Goodwater	94	46	71.0	5.31	
Greensboro	92	48	71.6	6.09	
Greenville				3.92	
Hamilton	90			6.66	
Healing Springs	93	46	71.0	3.81	
Helena				4.90	
Highland Home	89	47	72.4		
Letohatchee				5.12	
Livingston[a]	91	48	70.3	3.28	
Lock No. 4	91	47	68.3	3.98	
Madison Station	92	42	67.8	3.92	
Maplegrove	93	46	67.3	6.84	
Marion	94	48	72.4	5.25	
Mount Willing	93	49	73 0	8.34	
Newbern	90	47	71.6	5.71	
Newburg	92	40	68.2	7.45	
Notasulga				5.57	
Oneonto	88	45	66.9	8.00	
Opelika	91	40	71.2	4.09	
Oxanna	89	46	68.4	6.11	
Pineapple	94	48	72.8	4.55	
Prattville	93	46	70.2		
Pushmataha	90	45	70.2	4.01	
Riverton	92[c]	41[c]	65.2[c]	2.52	
Scottsboro	90	46	65.8	4.90	
Selma	92	48	71.9	5.32	
Talladega	92	48	69.4	5.82	
Tallassee				4.89	
Thomasville	93	46	72.4	4.24	
Tuscaloosa	92	44	68.9	4.16	
Tuscumbia	90	46	68.1	3.63	
Tuskegee	95	46	72.1	4.87	
Union Springs	93	48	73.8	7.86	
Uniontown	92	46	72.0	4.80	
Valleyhead	90	44	67.0	9.34	
Verbena				4.97	
Wetumpka	93	47	72.8	4.11	
Alaska.					
Killisnoo	61	31	42.8	4.00	
Sitka	65	31	44.5	4.86	
Arizona.					
Allaire Ranch				0.16	
Arizona Canal Co. Dam	96	48	74.8	0.07	
Aztec[e1]	103	59	83.2	0.00	
Benson[e1]	92	55	78.8		
Bisbee	85	39	64.7	0.17	
Buckeye	96	45	72.1	0.00	
Casagrande[e1]	89	58	77.3	0.10	
Cochise[e5]	95	55	75.2	0.60	
Congress	92	43	72.6	0.30	
Dudleyville	96	41	70.8	0.22	
Fort Apache	86	32	60.8	1.15	
Fort Defiance	80	30	55.8	3.38	T.
Fort Grant	89	40	67.4	T.	
Fort Huachuca	87	49	70.6	0.90	
Fort Mohave	106	51	78.1	0.02	
Globe[b]	90	31	68.1	0.60	
Ingleside	99	47	73.4	0.26	
Jerome	86	44	67.0	0.90	
Maricopa[e1]	106	50	76.2	T.	
Mesa	93	44	71.2	T	
Mohawk Summit[e1]	107	62	80.6	0.00	
Mount Huachuca	86	38	67.8	T.	
Natural Bridge				1.24	
Nogales	91	40	64.8	0.44	
Oracle	87	42	67.8	0.46	
Oro				0.55	
Pantano[e5]	92	55	74.4	0.20	
Parker	105	47	77.2	T.	
Peoria	101	46	73.4	0.10	
Phoenix	100	45	73.4	0.21	
Pima	94	38	67.9	0.91	
Pinal Ranch				0.44	
Prescott	84	30	56.8	1.18	
San Carlos	96	35	68.7	0.37	
Showlow				1.58	
Arizona—Cont'd.	°	°	°	*Ins.*	*Ins.*
Signal	102	42	72.6	T.	
Silverking				0.55	
Strawberry	84[1]	29	57.4[c]	0.85	T.
Supai	101	50	74.4	T	
Tombstone	91	42	69.0	0.20	
Tonto	94	44	68.8	0.96	
Tuba	89	35	65.2	T.	
Tucson	97	41	72 2	0.41	
Vail[e5]	96	55	76.2	0.12	
Walnut Grove				0.05	
Willcox[e1]	89	65	76.6	0.16	
Yarnell				0.59	
Arkansas.					
Amity	91	43	68.9	7.22	
Arkadelphia	93	47	70.1	3.89	
Arkansas City				2.70	
Batesville	94	44	68.0	2.74	
Beebranch	92	42	68.0	1.45	
Blanchard Springs	91	43	69.8	7.85	
Brinkley	92	41	67.0	1.42	
Camden[a]				6.93	
Camden[b]	90	48	71.3	6.00	
Conway	94	47	69.6	1.24	
Corning	92	39	65.2	1.45	
Dallas	88	43	68.2	4.94	
Dardanelle				0.43	
Dutton	83[3]	37[4]	64.0[3]	1.59	
Elon	91	42	69.0	5.21	
Fayetteville	86[c]	36[c]	65.0[c]	1.26	
Forrest City	92	42	68.0		
Fulton				2.70	
Hardy	91	43	66.4	1.20	
Helena[a]				4.13	
Helena[b]	91	48	68.0	3.93	
Hot Springs[b]				1.94	
Ione	88	38	67.5	2.35	
Jonesboro	100	44	71.6	1.66	
Keesees Ferry	90	38	66.4	1.45	
Lacrosse	90	43	68.0	1.48	
Lonoke	93	42	68.6	3.05	
Luthersville	88	41	67.8	3.08	
Malvern	95	41	68.9	2.59	
Marianna	92	42	68.6	1.88	
Marvell	90	43	68.8	4 59	
Mossville	84	41	64.2	2.99	
Mount Nebo	86	34	68.2	1.50	
New Gascony	92	44	71.0	4.13	
Newport[a]				2.89	
Newport[b]	96	44	68.2	3.03	
Newport[c]	92	43	67.2	2.71	
Oregon	90	35	68.8	1.13	
Osceola	93	43	68.0	4.35	
Ozark	90	47	70.0	5.10	
Pinebluff	95	45	69.8	3.20	
Pocahontas	92	41	63.4	0.70	
Pond	86	31	64.6	0.49	
Prescott	94	47	70.6	2.87	
Rison	98	41	69.8	4.56	
Rosadale	92	45	70.0	4.52	
Russellville	90	43	68.8	1.94	
Silversprings	87	40	65 9	0.57	
Spielerville	90	42	69.2	2.29	
Stuttgart	90	43	68.2	3.17	
Texarkana	94	45	71.0	4.29	
Warren	91	45	69.4	4.69	
Washington	90	45	69.2	3.95	
Wiggs	91	41	67.9	5.35	
Winchester[e]	93	48	69.8		
Winslow	88	38	63.6	2.51	
Witts Springs	92	41	67.2	3.51	
California.					
Angiola	94	42	67.0	1.10	
Bakersfield	94	43	67.0	1.09	
Ballast Point L. H.				0.55	
Bear Valley				1.69	1.0
Bellevue				1.13	
Berkeley	81	43	56.8	1.02	
Bishop	89	35	60.6	1.29	
Boca[e1]	78	27	44.6	1.86	2.0
Bodie	71	16	41.8	0.77	5.0
Bowman				1.73	3.0
Branscomb				0.95	
Caliente[e1]	90	50	67.6	1.18	
Campbell	90	36	57.2	0.85	
Cape Mendocino L. H.				1.25	
Cedarville	81	29	54.0	0.53	
Chico[e1]	98	53	68.4	0.75	
Cisco[e1]	75	32	43.4	3.25	15.0
Claremont	80	40	59.0	1.02	
Corning[e5]	92	54	72.2	1.07	
Crescent City	65	38	51.8	2.40	
Crescent City L. H.				3.21	
Cuyamaca[e5]	70	30	49.4	3.87	4.5
Delano[e1]	93	50	73.0	1.48	
Delta[e1]	88	50	68.3	0.65	
Drytown	93	39	62.5		
California—Cont'd.	°	°	°	*Ins.*	*Ins.*
Dunnigan[e1]	98	50	67.0	1.02	
Durham[e5]	92	49	65.2	0.52	
East Brother L. H.				1.10	
Edmanton[e1]	79	32	50.0	1.34	2.0
Elcajon				0.67	
Elmdale	95	39	62.6	0.71	
Elsinore	86	42	62.2	0.47	
Escondido	86	37	64.7	1.31	
Fallbrook	82	42	61.8	1.26	
Folsom City[e1]	100	52	65.5	0.45	
Fordyce Dam				2.04	5.0
Fort Ross	73	40	54.3	1.16	
Fort Tejon				0.90	
Georgetown	90	35	57.8	0.99	
Gilroy (near)	93	35	58.0	1.11	
Glendora				1.80	
Goshen[e5]	92	40	68.2	1.57	
Grand Island[e5]	93	46	65.7	1.04	
Grass Valley				1.36	
Greenville	85	27	53.9	1.33	
Hanford	93	34	65.0	1.48	
Healdsburg	101	35	60.4	1.00	
Hollister	89	37	57.2	0.71	
Humboldt L. H.				1.47	
Idylwild				1.22	T.
Indio[e1]	100	50	77.1	0.00	
Iowa Hill[e1]	86	44	58.1	0.96	
Irvine	82	54	66.7	1.13	
Jackson (near)	84	32	57.6	1.18	
Jolon				0.33	
Keene				1.15	
Kennedy Gold Mine	86	35	56.4	0.83	
Kent				2.80	
King City				1.01	
Kono Tayee	83	40	60.6	0.96	
Laguna Valley				2.09	
Lamesa				0 47	
Laporte[e1]	72	35	48.8	2.09	5.9
Las Fuentes Ranch				1.02	
Legrand	97	38	63.4	0.38	
Lemoncove	95	40	67.4	2.70	
Lemoore[a]	98	50	67.4	1.21	
Lick Observatory	72	24	50.2	1.07	1.0
Lime Point L. H.				0 54	
Lodi	93	43	62.0	1.21	
Los Gatos	90	40	58.2	1.76	
Mammoth[e1]	101	57	81.1	0.00	
Manzana	93	40	64.2	0.12	
Mare Island L. H.				1.10	
Merced[b]	92	41	64.0	0.05	
Milla College				1 12	
Milo				3.36	
Milton (near)	92	41	61.4	1.17	
Modesto[e1]	93	50	65.9	1.55	
Mohave[e1]	90	45	65.5	0.28	
Mokelumne Hill[e3]		44	56.2	0.72	
Monterio	84	36	58.2	1.05	
Monterey[e5]	80	40	57.6	0 39	
Morena	82	36	56.0	1.83	
Mountainview				0.73	
Mount St. Helena				1.60	
Mutah				0.58	
Napa	100	40	61.0	1.11	
Needles	104	58	81.2	0.00	
Nevada City	85	36	55.4	1.29	
Newhall[e1]	86	48	62.1	1.62	
Niles[e1]	98	53	62.0	1.26	
North Bloomfield	92	34	56.2	1.73	T.
North Ontario	75	44	57.4	1.50	
North San Juan[e1]	93	38	54.5	1.31	
Oakland	86	44	58.9	0.89	
Ogilby[e5]	101	60	80.4	0.00	
Oleta[e1]	86	43	57.6	0.99	
Orland[e1]	95	53	68.6	0.81	
Palermo	97	41	64.4	0.60	
Palomar Mountain				3.25	2.0
Paso Robles	94	36	60.6	1.43	
Peachland[e5]	90	45	60.2	1.49	
Piedras Blancas L. H.				0.77	
Pigeon Point L. H.				0.25	
Pilot Creek				1.61	T.
Pine Crest	81	45	56.0	1.13	
Placerville	86	32	56.4	1.05	
Point Ano Nuevo L. H.				0.40	
Point Arena L. H.				0.56	
Point Bonita L. H.				0.92	
Point Conception L. H.				0.07	
Point Fermin L. H.				0.35	
Point George L. H.				0.91	
Point Hueneme L. H.				0.23	
Point Lobos	67	46	53.4	0.72	
Point Loma L. H.				0.28	
Point Montara L. H.				0.85	
Point Pinos L. H.				0.21	
Point Sur L. H.				0.40	
Pomona (near)	86	43	64.4	1.00	

TABLE II.—*Climatological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
California—Cont'd.	°	°	°	*Ins.*	*Ins.*
Poway[*5]	79	47	62.7	0.65	
Quincy	81	33	55.4	1.18	
Ranch House				1.47	
Redding	93	41	65.6	0.41	
Redlands	84	43	63.0	1.62	
Reedly	92	49	68.8	1.11	
Represa	92	44	62.2	0.67	
Riovista	94	42	62.2	0.68	
Riverside	84	44	62.4	0.54	
Roe Island L. H				0.80	
Rohnerville				0.98	
Rosewood	98	34	66.3	0.47	
Sacramento	91	42	63.5	0.70	
Salinas[*1]	70	49	57.2	0.35	
Salton[*1]	105	63	82.8	0.00	
San Bernardino	86	39	63.2	1.23	
San Jacinto	88	40	64.2	0.55	
San Jose				0.82	
San Leandro	97	38	58.4	0.99	
San Luis L. H				0.16	
San Mateo				0.81	
San Miguel[*1]	90	49	61.7	1.43	
San Miguel Island	70	45	55.1	0.05	
Santa Barbara	82	46	57.8	0.34	
Santa Barbara L. H				0.34	
Santa Clara				1.18	
Santa Cruz	78	34	55.9	0.52	
Santa Cruz L. H				0.48	
Santa Maria	77	43	59.1	0.13	
Santa Monica				0.58	
Santa Paula	83	45	61.2	0.13	
Santa Rosa[*1]	82	38	59.1	1.12	
Shasta	96	37	67.6	0.39	
Sierra Madre	78	45	59.6	2.51	
Snedden				0.47	
Sonoma				1.02	
S. E. Farallone L. H				0.30	
Stanford University	88	41	56.9	0.59	
Stockton	92	40	59.2	0.81	
Storey	87	38	63.4	0.57	
Summerdale	72	26	48.5	2.31	4.0
Susanville	82	31	57.0	0.92	
Tehama[*1]	90	53	71.2	0.66	
Tejon Ranch	90	47	66.4	1.28	
Templeton	75	45	58.9	1.50	
Thermalito	98	44	64.8	0.60	
Trinidad L. H				1.58	
Truckee[*1]	70	28	43.6	0.70	7.0
Tulare *b*				1.79	
Tulare *c*	96	42	66.6	1.87	
Ukiah	86	32	58.4	0.89	
Upperlake	92	35	60.0	0.70	
Vacaville[*1]	93	49	63.2	1.04	
Ventura	74	45	58.5	0.16	
Visalia *b*	92	41	65.3	1.74	
Volcano Springs	108	60	82.5	0.00	
Wasco	94	39	67.0	1.30	
Westpoint				1.94	
West Saticoy				0.25	
Wheatland	97	43	62.8	0.30	
Williams[*5]	96	51	69.5	1.41	
Wilmington[*1]	77	50	59.1	0.30	
Wire Bridge[*5]	93	48	65.3	0.68	
Yerba Buena L. H				0.76	
Yreka	83	31	56.8	0.52	
Yuba City[*5]	95	54	70.3	0.28	
Zenia				1.38	
Colorado.					
Alford	80[c]	20	51.2	10.52	
Amity	85	31	60.8	1.04	
Arkins				2.90	
Ashcroft				1.69	9.1
Bailey	76	25	48.0	1.48	
Blaine	92	32	61.1	2.74	
Boulder	81	39	59.5	1.62	
Boxelder				4.18	
Breckenridge	66	20	40.3	2.87	15.8
Buenavista				0.30	1.0
Canyon	84	37	59.0		
Castlerock	80	32	56.1	1.82	
Cedaredge	88	32	58.4	1.26	2.0
Cheyenne Wells	84	30	58.8	1.18	
Clearview	64	19	42.6	6.43	T.
Colibran	86	32	58.0	2.37	T.
Colorado Springs	76	34	53.8	3.49	
Crook	86	33	58.9	1.25	
Delta	92	32	62.0	0.97	
Dumont				2.78	T.
Durango	86	15	48.6	2.05	4.5
Fort Collins	83	31	57.0	7.47	
Fox				0.64	
Gleneyrie	76	38	53.4	2.40	
Greeley	87	32	58.7	2.38	
Grover				1.50	
Gunnison	85	22	50.8	1.44	6.0
Hamps	81	29	54.6	0.83	
Hoehne	85	35	58.0	2.30	
Holly	88	33	62.2	2.05	
Holyoke (near)	88	33	59.8	0.70	
Hugo				T.	
Husted	77	28	52.3	2.71	
Lake Moraine				6.98	16.0
Lamar	91	34	63.9	1.50	
Laporte				4.32	
Las Animas	87	33	61.2	2.40	
Lay	87	28	56.4	2.66	
Leadville (near)				1.28	8.0
Leroy	86	32	57.7	0.72	
Longs Peak	67	24	44.0	1.73	3.0
Mancos	80	29	54.4	3.76	3.5
Marshall Pass				1.73	18.0
Meeker	82	26	54.4	2.52	T.
Mitchell				0.78	4.8
Montrose				0.50	
Moraine	70	27	47.7	3.32	
Pagoda	81	30	54.2	1.58	
Parachute	89	32	61.7	2.32	1.0
Perrypark				2.11	
Rangely	87	30	57.7	0.81	
Rockyford	88	37	61.4	1.34	
Rogers Mesa	87	32	59.7	1.95	T.
Ruby				3.55	30.0
Russell	73	20	47.3	3.11	
Saguache	83	26	52.5	0.90	
Salida	86	29	54.4	1.49	
San Luis	86	28	52.2	1.59	
Santa Clara	77	31	50.2	7.50	
Sapinero				1.49	12.0
Seibert				0.29	
Silt	85	31	57.7	2.26	7.0
Sugarloaf	73	30	50.8	3.60	
Telluride	77	26	49.6	1.55	11.0
Trinidad	84	37	58.6	3.77	
T. S. Ranch	85	34	60.2	1.44	T.
Twinlakes				2.05	2.0
Vilas				4.12	
Wagon Wheel	74	18	45.2	1.45	1.5
Wallet				0.59	
Westcliffe	75	23	47.4	6.51	T.
Wray	89	30	60.7	0.28	
Yuma				0.31	
Connecticut.					
Bridgeport	82	37	57.0	8.20	
Canton	81	30	55.0	7.21	
Colchester	82	35	55.8	7.29	
Falls Village				6.07	
Hartford *b*	80	42	57.0	6.78	
Hawleyville	80	39	56.6	7.23	
Middletown	82	35	56 6	8.05	
New London	80	39	55.4	4.75	
North Grosvenor Dale	83	32	55.2	5.12	
Norwalk	83	33	56.5	8.34	
Southington	79	34	56.6	7.00	
South Manchester				5.45	
Storrs	80	34	54.5	6 30	
Voluntown	82	34	55.0	6.08	
Wallingford				7.80	
Waterbury	83	33	57.5	8.08	
West Cornwall	77	38	56.4	6.90	
West Simsbury				7.15	
Delaware.					
Milford	86	41	61.8	3.86	
Millsboro	84	38	60.6	2.90	
Newark	82	39	59.4	3.30	
Seaford	85	44	63.2	3.02	
Wyoming				5.16	
District of Columbia.					
Distributing Reservoir[*5]	84	52	64.6	2.17	
Receiving Reservoir[*5]	82	52	64.1	3.33	
West Washington	85	41	62.2	3.41	
Florida.					
Archer	95	50	76.0	4.18	
Bartow	94	50	75.8	2.90	
Carrabelle	90[c]	56[c]	74.4[c]	1.05	
Clermont	96			5.87	
De Funiak Springs	94	50	73.3	8.91	
Deland	93	59	75.3		
Earnestville	97	56	77.6	1.45	
Eustis	98	53	78.0	5.97	
Federal Point	93	50	74.4	3.68	
Flamingo	92	54	74.0	3.15	
Fort Meade	95	47	77.8	4.40	
Fort Pierce	95	52	74.6	6.92	
Gainesville	95	52	76.1	2 03	
Huntington	95	47	74.6	3.44	
Hypoluxo	89	59	75.3	7.11	
Inverness	92	54	74.4	3.29	
Jasper	93	53	74.8	6.22	
Kissimmee	93	55	75.0	2.96	
Lake Butler	96	49	74.0	2.91	
Lake City	95	51	74.4	5.16	
McAlpin[f]	98	51	75.6	5.75	
Macclenny	97	46	75.2	5.33	
Manatee	92	49	72 5	1.75	
Marco	92	60	77.0	1.88	
Marianna	93	51	74.2	6.61	
Merritt Island	92	60	76.6	3.12	
Miami	91	57	75.0	10.42	
Micanopy	95	49	75.4	2.23	
Middleburg	94	43	72.5	5.86	
Myers	92	56	74.8	2.30	
New Smyrna	95	52	74.0	1.50	
Nocatee	96	51	75.8	3 88	
Ocala	96	51	75.8	3.24	
Orange City	95	51	76.1	3.13	
Orlando	93	58	76.4	2.15	
Plant City	95	47	74.0	6.69	
Quincy	98	48	75.6	4.90	
Rockwell	95	50	75.2	6.00	
St. Andrews	92	54	73.5	4.26	
St. Augustine				3.34	
Sebastian	92	58	75.4	5.26	
Stephensville[*1]	95	50	73.2	3.32	
Sumner	92	48	72.0	2.59	
Switzerland	94	51	75.2	5.17	
Tallahassee	91	50	74.0	5.07	
Titusvi le	95	54	74.8	1.66	
Wausau	97	50	74.8	8.76	
Wewahitchka	96	52	75.5	6.40	
Georgia.					
Adairsville	88	48	68.4	6.50	
Albany	97	51	74.6	8.08	
Allapaha	94	50	73.4	4.14	
Americus	95	51	73.6	4.14	
Athens *b*	89	47	69.6	4.90	
Auburn	90	48	68.7	3.59	
Bainbridge	92	49	74.1	4.08	
Bowersville	92	46	69.8	6.77	
Brent	95	47	71.9	4.32	
Camak	94	49	73.4	5.53	
Canton				7.95	
Carlton				5.43	
Clayton	89	40	64.1	3.71	
Columbus	90[d]	53[d]	72.4[d]	4.92	
Covington	93	46	70.6	5.99	
Dahlonega	92	48	67.9	10.39	
Diamond	88	42	65.2	9.09	
Dublin				3.06	
Eastman	96	52	74.1	6.91	
Elberton	93	47	70.6	5.99	
Experiment	92	50	71.0	6.09	
Fitzgerald	95	50	74.4	7.04	
Fleming	98	47	73.2	3.98	
Fort Gaines	94	52	73.7	3.65	
Gainesville	90	47	69.0	6.35	
Gillsville	93	43	69.0	6.11	
Greenbush	93	43	67.0	6.93	
Griffin	94	47	70.8	5.55	
Harrison	94	48	72.0	5.26	
Hawkinsville	90[c]	50[b]	72.7[c]	3.86	
Hephzibah				5.35	
Jesup	93	50	73.8	5.57	
Lost Mountain	89	48	68 9	7.91	
Louisville	94	49	73.4	5.75	
Lumpkin	95	48	73.6	5.01	
Marshallville	93	54	75.0	4.41	
Mauzy	99	45	74.9	6.95	
Milledgeville	96	48	73.1	3.25	
Millen	97	47	73.8	4.60	
Morgan	92	48	71.4	6.28	
Naylor	96	50	73.4	8.60	
Newnan	92	48	70.2	9.85	
Oakdale				6.68	
Point Peter	95	45	69.8	6.22	
Poulan	93	45	72.0	8.89	
Putnam	93	53	72.6	5.79	
Quitman	96	48	74.4	3.31	
Ramsey	88	45	65.4	7.08	
Resaca				5.82	
Rome	89	47	67.6	6.08	
Statesboro	96	49	74.7	9.89	
Talbotton	93	49	70.6	5.85	
Tallapoosa	89	44	67.4	9.22	
Thomasville	94	50	73.6	2.17	
Toccoa	90	41	68.6	6.19	
Union Point	93	46	70.6	4.47	
Valona	98	50	73.8	3.46	
Vidalia	95	50	74.0	2.74	
Washington	92	49	72.0	6.43	
Waycross	94	52	74.7	4.41	
Waynesboro	96	50	72.8	3.46	
Westpoint	92	48	71.4	6.22	
Woodbury	94	45	70.1	6.77	
Idaho.					
Albion	88	25	55.6	1.88	
American Falls	88	27	57.2	2.05	
Atlanta	79	23	51.5	0.97	

TABLE II.—*Climatological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Idaho—Cont'd.	°	°	°	*Ins.*	*Ins.*
Blackfoot	92	31	61.4	0.54	
Burnside	77	32	53.4	0.97	
Chesterfield	85	22	52.2	1.25	
Downey	82	29	55.2	0.41	
Forney	87	20	52.9	2.89	
Garnet	79	35	68 4	0.74	
Hagerman	93	31	62.0	0.51	
Hailey	84	31	56.5	1.25	
Idaho City	89	25	57.9	0.28	
Lake	76	20	50.2	1.40	
Lakeview	85	31	55 2	1.96	
Lost River	85	30	56.6	0.94	
Moscow	84	32	56.4	2.40	
Murray	84	28	54.9	3.32	
Ola	88	32	59.8	0.93	
Paris	87	30	58.8	0.60	
Payette	90	32	62.4	1.09	
Pollock	91	33	60.2	2.19	
Priest River	86	37	54.8	3.80	
St Maries	85	32	57.1	2.63	
Soldier	84	19	53.3	0.45	
Swan Valley	84	24	55.0	2.35	
Vernon				1.44	
Weston	86	31	59.0	2.28	
Illinois.					
Albion	90	39	63.9	1.60	
Aledo	88	37	60.8	1.98	
Alexander	90	36	62.2	0.70	
Ashton	90	33	58.1	2.68	
Astoria	87	35	61.5	0.58	
Aurora *a*	90	35	58.7	0.71	
Beardstown				0.67	
Bloomington	92	36	61.7	2.09	
Bushnell	91	38	62.0	0.70	
Cambridge	88	39	60.6	2.06	
Carlinville	91	36	63.1	0.86	
Carlyle				2.38	
Centralia	94	36	65.2	0.98	
Charleston	90	38	62.3	2.87	
Chester				1.56	
Clare	88	38	62.3	1.82	
Coatsburg	90	36	63.4	0.45	
Cobden	93	38	64.8	1.69	
Danville	90	34	59.8	3.04	
Decatur	91	36	61.4	2.00	
Dixon	88	38	59 8	2.28	
Dwight	88	36	59.6	1.93	
Effingham	90	38	63.6	1.29	
Equality	92	37	65.3	1.65	
Flora	89	38	63.2	2.04	
Galva	89	36	59.9	1.51	
Grafton				0.38	
Greenville	91	38	64.2	1.96	
Griggsville	90	38	63.8	0.46	
Halfway	90	41	65.0	2.30	
Halliday	91	36	65.0	2.03	
Havana	90	38	64.5	0.66	
Henry	90	34	60.1	2.20	
Hillsboro	89	40	62.6	1.46	
Joliet	89	37	58.7	0.81	
Kishwaukee	90	34	58.0	2.00	
Knoxville	88	32	58.9	1.25	
Lagrange	90	35	57.4	0.96	
Laharpe	88	34	61.4	2.10	
Lanark	89	29	59.3	2.72	
La Salle	89[1]	38[1]	60.4[b]	1.34	
Loami				1.92	
McLeansboro	91	38	64.6	1.06	
Martinton	91	34	59.2	2.19	
Mascoutah	90	36	62.4	4.19	
Mattoon	90	40	62.7	2.97	
Minonk	92	35	59.4	2.41	
Monmouth	89	33	61.0	1.28	
Monticello	89	37	60.9	2.68	
Morgan Park				0.85	
Morrisonville	90	39	62.0	1.98	
Mount Carmel				1.84	
Mount Pulaski	90	37	62.2	2.24	
Mount Vernon	94	39	65.2	1.23	
New Burnside	94	39	66.4	1.63	
Olney	88	39	63 8	3.09	
Ottawa	94	39	62.2	2.15	
Palestine	85	36	61.0	1.34	
Pana	91	39	62.2	3.61	
Paris	91	39	62.3	2.78	
Peoria *a*				1.48	
Peoria *b*	92	38	62.8	1.50	
Philo	91	36	59.7	2.66	
Plumhill	89	35	62.6	1.34	
Rantoul	91	38	60.0	4.38	
Raum	93	43	66.0	1.51	
Riley	90	35	58.2	1.10	
Robinson	87	38	61.6	1.75	
Rockford	90	37	59.0	2.14	
Roundgrove	83	35	58.5	2.62	
Rushville	88	38	62.2	0 69	
St. Charles[2,5]	87	42	61.4	1.51	
St. John	94	36	66.3	1.68	
Shobonier	89	35	62.4	2.24	
Strawn	90	36	60.0	2.77	
Streator		32		1.24	
Sullivan	88	38	60.4	5.02	
Sycamore	88	32	57.8	1.63	
Tilden	90	35	63.2	2.32	
Tiskilwa	88	37	59.4	2.63	
Tuscola	91	37	61.2	3.82	
Walnut	90	36	61.0	2.43	
Wellington	89	37	60.2	1.20	
Winchester	91	37	63.6	1.45	
Winnebago	90	35	58 6	2.79	
Yorkville	87	32	56.9	0.67	
Zion	90	33	59.9	2.56	
Indiana.					
Anderson	85	36	59.1	2.79	T.
Angola	83	35	56.4	2.75	
Auburn	88	31	57 9	2.45	
Bloomington	86	39	61.0	1.00	
Bluffton	88	33	59.0	4.16	
Boonville	91	39	64.8	1.60	
Bright	85	37	63.4	2.90	
Butlerville	87	33	61.7	2.15	
Cambridge City	85	31	59.0	2.78	
Columbus	89	35	62 5	1.31	
Connersville	86	34	60.8	2.65	
Crawfordsville	92	40	63.2	2.80	
Delphi	90	36	59.4	3.62	
Edwardsville[2,4]	86	47	64.4	2.18	
Fairmount	89	34	59.5	3.59	
Farmland	85	35	58.1	2.89	
Franklin[2,1]	87	50	62 4	1.29	
Greencastle	83	41	60.0	2.82	
Greensburg	84	34	61.6	2.66	
Hammond	87	35	56.4	1.82	
Hector	85	34	59.3	3.87	
Huntington	88	39	59.6	5.89	
Jeffersonville	89	40	63.8	2.72	
Knightstown	88	35	61.0	2.18	
Kokomo		39		4.91	
Lafayette	88	37	59.5	2.89	
Laporte	89	35	58.8	1.82	
Logansport	89	37	59.6	2.64	
Madison *a*	89	39	63.5	2.40	
Madison *b*				2.00	
Marengo	91	34	62.4	2.37	
Marion	88	35	59.7	5.20	T.
Markle	86	35	58.4	5.20	
Mauzy	87	33	59.8	2.32	
Mount Vernon	94	40	64.5	0.88	
Northfield	87	34	58.3	3.29	
Paoli	90	36	62.7	1.07	
Princeton	90	34	63.4	1.93	
Richmond	91	31	59.7	2.52	
Rockville	88	38	59.6	2.26	
Salem	92	31	63.4	1.98	
Scottsburg	87	43	63 4	2.06	
Seymour	87	41	61.9	2.15	
Shelbyville				3.14	
South Bend	87	35	58.0	1.96	
Syracuse	86	33	58.0	2.10	
Terre Haute	95	41	63.3	2.47	
Topeka	83	35	56.6	1.48	
Veedersburg	89	35	60.4	2.68	
Vevay	90	41	63.4	4.93	
Vincennes	91	39	64.0	1.21	
Washington	92	36	63.8	0.82	
Winamac	89	33	59.8	1.16	
Worthington	89	36	62.1	1.75	
Indian Territory.					
Bengal	88	42	67.8	9.08	
Chickasha	94	43	69 2	8.33	
Claremore	89	40	67.6	1.90	
Colbert				5.00	
Fairland	86[6]	39[6]	65.2[6]	2.47	
Hartshorne	92	46	71.2	6 31	
Healdton	97	40	69.0	8.48	
Holdenville	91	41	68.3	5.55	
Lehigh	97	44	70.1	9.48	
Marlow	93	43	69.6	6.93	
Muscogee	93	41	67.9	3.03	
Pauls Valley	92	42[3]	68.2	7.72	
Roff				8.85	
Ryan	97	46	71.2	9.78	
Sapulpa	93	41	68.2	1.90	
South McAlester				6.80	
Tahlequah	89	39	67.8	2.35	
Tulsa				2.88	
Wagoner	92	39	68.9	1.65	
Webbers Falls	90	45	69.6	2.87	
Iowa.					
Afton	87	36	61.0	2.90	
Albia	88	36	60.4	1.46	
Algona	88	32	60.0	2.93	
Alta	89	32	59.7	1.86	
Amana	89	36	60.8	1.83	
Ames *b*	89	37	61.4	3.69	
Atlantic	89	29	60.4	2.48	
Audubon	92	35	60.0	1.00	
Battle Creek				1.51	
Baxter	87	35	60.6	2.07	
Belknap	89	38	63.0	0 72	
Belleplaine	89	36	60.6	4.57	
Bonaparte	90	35	62.4	1.30	
Britt	88	31	58.3	2.63	
Buckingham				3.00	
Burlington	91	37	63.3	2.10	
Bussey				1.43	
Carroll	88[6]	32	59.0	2.20	
Cedar Rapids	91	39	61.8	1 86	
Chariton	87	34	60.4	1.28	
Charles City	90	33	60.4	2.30	
Clarinda	91	35	61.5	2.10	
Clearlake	95	31	62.8	2.10	
Clinton	91	32	61.0	1.72	
College Springs	88	34	61.0	3.00	
Columbus Junction	90	35	63.0	1.95	
Corning	86	34	60 8	4 15	
Council Bluffs	90	35	62.1	2.51	
Cresco	90	32	58.6	2.02	
Cumberland				2.33	
Danville				2.18	
Decorah	92	32	59.8	3.88	
Delaware	88	33	58.4	1.70	
Denison	87	32	58.7	1.34	
Desoto	86	38	62.6	3.03	
Dows	87	32	59.1	2.42	
Eldon	92	33	62.2	0.99	
Elkader	92	36	61.6	2.34	
Emerson				3.13	
Estherville	88	29	57.4	2.38	
Fonda				2.85	
Forest City	87	30	59.7	2.08	
Fort Dodge	90	34	60.2	3.75	
Fort Madison				3.11	
Fruitland	92	38	63.4	1.60	
Galva	91	32[6]	59.3[6]	1.12	
Gilman				2.98	
Glenwood	87	39	62.2	2.31	
Grand Meadow	86	33	59.1	2 85	
Greene	91	33	60.6	1.58	
Greenfield	88	34	61.2	3.28	
Grinnell	86	37	59.0	2.82	
Grinnell (near)	89	36	61.2	3.55	
Grundy Center	90	34	59.9	2 84	
Hampton	92	33	61.7	2.06	
Harlan	91	30	60.8	1.78	
Hawkeye				1.75	
Hopeville	85	38	60.2	3.22	
Humboldt	88	33	60.1	3.64	
Independence	87	34	59 0	2.00	
Indianola	86	37	61.6	1.58	
Iowa City	88	36	62.3	1.54	
Iowa Falls	87	33	59.8	2.10	
Jefferson				1.44	
Keosauqua	90	37	63.2	1.43	
Lacona				2.05	
Lansing	93	35	61.5	2.97	
Larchwood	90	29	59.9	3.27	
Larrabee	90	28	57.8	2.57	
Leclaire				1.72	
Lemars	87	32	59.5	4.54	
Lenox	85	36	60.0	2.50	
Logan	92	31	61.6	2.54	
Maple Valley				1.80	
Maquoketa	91	30	59.8	1.91	
Marshalltown	91	36	61.5	2.89	
Monticello	90	35	61.2	1.56	
Mooar	88	29	60.4	2.18	
Mountayr	87	36	60.4	2.90	
Mount Pleasant	88	34	61.3	1.37	
Mount Vernon *b*	91	35	61.2	1.37	
Murray				2.59	
New Hampton	87	32	58.5	1.74	
Newton	90	37	62.2	2.24	
Northwood	88	31	59.6	4.09	
Odebolt	93	32	60.8	1.53	
Ogden	88	32	60.2	2.72	
Olin	86	33	59.8	1.69	
Onawa	90	35	61.8	2.95	
Osage	85	32	58 0	2.18	
Osceola	88	36	61.0	3.20	
Oskaloosa	88	35	61.2	2.08	
Ottumwa	88	40	63.0	0.95	
Ovid	89	33	61.2	1.54	
Pacific Junction	89	33	61.0	2.47	
Pella	89	36	62.0	1.47	
Perry	88	34	61.0	0.90	
Plover	91	31	60.0	1.36	

TABLE II.—*Climatological record of voluntary and other cooperating observers.*—Continued.

Stations.	Temperature. (Fahrenheit.)			Precipitation.	
	Maximum.	Minimum.	Mean	Rain and melted snow.	Total depth of snow.
Iowa—Cont'd.	°	°	°	*Ins.*	*Ins.*
Primghar	91	33	62.4	2.75	
Redoak	9 d	39	61.4	3.29	
Ridgeway	9	34	61.0	3.22	
Rockwell City	8	35	60.4	2.53	
Ruthven	.....	30	.....	3.60	
Sac City	88	34	59.8	2.17	
St. Charles	87	37	61.4	2.45	
Scranton	88	36	61.0	2.27	
Sheldon	89e	31e	59.6e	4.09	
Sibley	91	30	59.6	3.72	
Sigourney	94	35	62.7	2.24	
Sioux Center	89	31	60.0	4.31	
Spirit Lake	91	29	59.3	2.66	
Storm Lake	85	32	59.0	1.55	
Stuart	87	35	60.4	0.85	
Thurman	87	34	61.0	4.06	
Toledo	92	30	62.0	2.87	
Villisca	89	32	61.0	2.10	
Vinton *1	90	38	61.5	2.42	
Wapello	90c	37	63.3	2.58	
Washington	89	34	60.7	2.06	
Washta	.....	.....	.....	2.86	
Waterloo	91	36	60.8	1.79	
Waverly	91	35	60.6	2.38	
Westbend *1	89	33	59.1	2.17	
West Union	.....	.....	.....	2.11	
Wilton Junction	89	33	60.9	1.63	
Winterset	90	35	62.8	2.13	
Woodburn	.....	.....	.....	2.67	
Kansas.					
Achilles	89	25	59.4	0.63	
Altoona	92	39	65.2	2.79	
Anthony	.....	.....	.....	1.43	
Atchison a	88	38	62.7	1.40	
Beloit	86	30	61.0	1.91	
Burlington	88	36	64.8	1.33	
Chanute	89	40	67.2	3.73	
Colby	88	26	59.7	0.85	
Coolidge	90	31	61.9	2.45	
Delphos	84	36	62.7	3.11	
Dresden	87	33	59.6	1.29	
Ellinwood	84	34	62.2	1.43	
Englewood	91	36	64.2	2.33	
Eureka	.....	.....	.....	0.52	
Eureka Ranch	88	29	61.2	1.49	
Fallriver	87e	37e	64.2e	0.56	
Fanning	89	30	61.6	1.08	
Farnsworth *1	88	40	62.0	1.02	
Fort Leavenworth	86e	42e	65.0e	1.30	
Fort Scott	91	38	65.4	3.04	
Frankfort	91	35	63.0	2.57	
Garden City	89	32	63.5	1.20	
Gove *1	85	35	61.0	1.35	
Grenola	90	37	64.8	2.17	
Hanover	89	.....	.....	2.73	
Harrison	88	33	61.6	0.82	
Hays	85	31	60.7	1.41	
Horton	86	39	62.4	1.45	
Hoxie	88	28	61.0	1.15	
Hutchinson	86	34	63.2	1.09	
Independence	88	41	66.5	4.18	
Jetmore	89	32	62.9	0.86	
Lakin	89	30	62.0	0.42	
Lawrence	86	42	64.4	1.02	
Lebo	88	39	65.0	1.03	
Leoti	88	28	60.7	2.05	
Little River	86	33	63.2	2.78	
Macksville	84	31	61.2	0.77	
McPherson	85	36	63.6	1.76	
Madison	87	39	64.2	0.58	
Manhattan c	89	34	63.8	1.73	
Marion	85	39	64.7	1.35	
Medicine Lodge	91	39	66.0	1.82	
Minneapolis	90	36	62.2	2.44	
Moran	85	39	63.6	3.08	
Mounthope *1	83	49	65.0	1.44	
Ness City	92e	33e	64.1e	1.35	
Newton	89	36	64.9	1.26	
Norwich	84	37	64.2	1.92	
Oberlin	.....	.....	.....	1 00	
Olathe	86	36	64.4	0.44	
Osage City	87	48	69.0	1.46	
Osborne	.....	.....	.....	1.55	
Oswego	87	40	65.4	3.05	
Ottawa	.....	37	.....	1.45	
Phillipsburg	.....	.....	.....	1.47	
Pratt	87	33	63.3	0.91	
Rome	88	36	64.2	2.35	
Russell	88	35	61.6	1.20	
Salina	83	37	62.2	1.88	
Sedan	94	41	65.0	3.91	
Seneca	89	34	61.9	1.82	
Toronto	87	39	64.4	2.15	
Ulysses	95	29	64.5	1.33	
Valley Falls	87	36	62.4	0.86	
Kansas—Cont'd.					
Viroqua	90	35	62.7	2.11	
Wakeeney (near) *1	84	36	61.7	1.37	
Wallace	.....	.....	.....	1.32	
Wamego *1	88	34	63.2	0.92	
Winfield	89	41	65.6	2.42	
Yates Center	87	38	64.0	1.63	
Kentucky.					
Alpha	91	41	63.3	3.27	
Anchorage	88	37	62.4	2.80	
Bardstown	91	39	64.5	3.17	
Berea	89	40	63.4	3.78	
Blandville	89	40	65.0	2 16	
Bowling Green	95	41	66.2	1.32	
Burnside	.....	.....	.....	3.90	
Catlettsburg	89	.....	.....	3.35	
Centertown	92	36	63.8	1.21	
Earlington	93	41	66.7	2.53	
Edmonton	91	40	64.0	2.69	
Eubank	88	39	62.6	3.07	
Falmouth	.....	.....	.....	3.08	
Fords Ferry	91	37	62.4	1.53	
Frankfort	86	42	63.2	2.28	
Franklin	93	44	67.1	2.79	
Georgetown	86	42	63.2	.....	
Greensburg	90	38	63.7	2.35	
Henderson	89	43	64 8	1.76	
Hopkinsville	97	40	65.2	1.89	
Irvington	87	39	63.0	1.41	
Leitchfield	88	41	62.4	2.35	
Loretto	89	34	61.4	1.53	
Manchester	95	38	65.2	1.71	
Marrowbone	88	41	62.4	2.51	
Maysville	91	38	63.2	3.39	
Mount Sterling	87	39	62.8	3.59	
Owensboro	89	40	63.6	2.54	
Owenton	85	42	62.3	2.89	
Paducah a	.....	.....	.....	1.83	
Paducah b	94	45	67.6	1.41	
Richmond	90	44	64.2	2.89	
St. John	88	38	62.0	2.65	
Scott	88	37	62.2	4.41	
Shelby City	88	37	61.2	2.82	
Shelbyville	91	38	64.5	2 17	
Vanceburg	89	38	59.0	2.00	
Warfield	90	38	63.2	5.11	
Williamsburg	89	43	62.0	4.73	
Louisiana.					
Abbeville	90	50	73.5	0.66	
Alexandria	94	44	73.1	1.59	
Amite	93	43	72.4	0.58	
Baton Rouge	90	51	72.8	1 97	
Burnside	91	46	72.0	1.21	
Calhoun	91	44	69.6	2.47	
Cheneyville	93	44	73.2	0.30	
Clinton	89	46	70.4	2.55	
Covington	95	45	73.6	0.85	
Donaldsonville	94	52	74.2	0.95	
Emille	90	48	72.5	0.75	
Farmerville	88	42	70.6	5.42	
Franklin	92	47	72.6	1.19	
Grand Coteau	92	47	73.5	0.68	
Hammond	92	45	73.2	0.54	
Houma	92	49	73.4	1.06	
Jeanerette	94	46	74.6	2.67	
Jennings	91	44	72.8	0.35	
Lafayette	93	46	72 9	1.02	
Lake Charles	92	49	72.5	0.45	
Lake Providence	91	48	71.3	7.20	
Lawrence	94	50	74.6	2.30	
Libertyhill	93	45	71.8	2.81	
Mansfield	92	42	70.4	2.64	
Melville	92	48	72.6	1.50	
Minden	94	45	70.4	4.97	
Monroe	94	51	72.5	2.68	
New Iberia	89	51	72.8	1.95	
Oakridge	94	44	71.0	5.23	
Opelousas	93	43	73.1	T.	
Oxford	90	41	69.6	2.13	
Paincourtville	94	47	73.2	0.65	
Plain Dealing	92	43	69.6	5.26	
Prevost	.....	.....	.....	0.85	
Rayne	94	49	76.4	0.72a	
Reserve	.....	.....	.....	2.70	
Robeline	92	41	69.6	1.20	
Ruddock	91	53	74.5	3.30	
Ruston	91	45	70.6	2.41	
Schriever	95	46	71.8	0.09	
Southern University	86	49	69.4	2.73	
Sugar Ex. Station	90	55	73.6	1.03	
Venice	89	52	71.1	0.54	
Wallace	92	49	73.8	0.64	
White Sulphur Springs	93	.....	.....	3.10	
Maine.					
Bar Harbor	80	30	50.7	2.74	
Belfast	79	33	52.2	2.09	
Calais	84	30	53.4	2.02	T.
Maine—Cont'd.					
Carmel	84	30	54.9e	2.95	
Cornish	88	32	54 0	8.40	
Fairfield	85	33	55.0	2.35	
Farmington	86	28	54.6	3.95	
Flagstaff	87e	25e	52.2e	2.34	
Gardiner	85	35	55.4	3.97	
Kineo	72	33	47.7	0.75	T.
Lewiston	85	35	54.8	5.77	
Mayfield	84	31	52.2	2.36	T.
North Bridgton	88	31	54.0	7.56	
Orono	85	32	53.7	2.07	T.
Rumford Falls	86	33	53.4	6.54	
Maryland.					
Annapolis	85	46	64.1	4.27	
Bachmans Valley	83	38	59.1	7.47	
Boettcherville	95	37	63.0	7.45	
Boonsboro a	87	40	62.2	6.01	
Carmichael	.....	.....	.....	4 03	
Charlotte Hall d	88	39	63.0	4.70	
Chase	77	36	60.9	2.95	
Cheltenham	84	39	62.1	2.50	
Chestertown	79	43	60.0	3.95	
Chewsville	84	36	60.8	5.71	
Clearspring	90f	41f	61.2f	7.12	
Coleman	.....	.....	.....	3.53	
Collegepark	85	36	60.8	4.17	
Cumberland b	.....	.....	.....	6.31	
Darlington	84	41	60.8	2.62	
Deerpark	84	25	55 2	5.40	
Denton	82	40	62.0	5.08	
Easton	80	43	61.4	3.63	
Fallston	80	41	60.0	2.88	
Frederick	85	42	63.4	4.07	
Frostburg	86	36	57.5	9.56	
Grantsville	82	33	56.1	8.32	
Greatfalls	88	38	62.3	3 82	
Greenspring Furnace	88	38	61.6	7.63	
Hagerstown	90	39	63.6	5.47	
Hancock	92	35	60.8	4 87	
Harney	.....	.....	.....	3.78	
Jewell	81	44	61.9	2.35	
Johns Hopkins Hospital	83	43	61.3	3.65	
Laurel	89	37	61.6	4.05	
McDonogh	82	40	60.1	5.12	
Mount St. Marys Coll	84	45	61.2	6.10	
Newmarket	85	41	61.9	3 86	
Pocomoke	82	43	62.1	3.16	
Prince Fredericktown	86	43	63.1	2 85	
Princess Anne	81	38	60.8	3.86	
Queenstown	79	43	61.8	3.34	
Rockhall b	79	41	61.0	3.22	
Sharpsburg	91	41	65 8	5.59	
Smithsburg a	86	35	60 6	5.37	
Smithsburg b	87	41	61.6	6.56	
Solomons	85	47	62.7	2.65	
Sudlersville	86	40	62.2	2.83	
Sunnyside	82	28	54.9	6.94	
Takoma Park	88	43	62.4	4 01	
Taneytown	87	41	62.5	3.19	
Van Bibber	80	43	61.4	3.29	
Westernport	87	36	58.9	7.37	
Westminster	83	41	60.2	3.51	
Woodstock	85	41	63.0	3.50	
Massachusetts.					
Amherst	81	33	56.6	5.12	
Bedford	80	37	54.0	6.92	
Bluehill (summit)	83	34	53.3	5.96	
Cambridge	85	36	55.2	7.41	
Chestnuthill	86	30	54.8	7.04	
Cohasset	.....	.....	.....	7.95	
Concord	87	35	55.0	7.52	
East Templeton *1	82	38	54.2	3.78	
Fallriver	79	40	55.8	7.56	
Fitchburg a *1	85	42	54.9	7.46	
Fitchburg b	87	36	55.2	6.94	
Framingham	86	34	56.4	7.00	
Groton	84	32	54.0	6.89	
Hyannis	.....	.....	.....	9 64	
Jefferson	.....	.....	.....	7.33	
Lawrence	87	35	55.0	6.42	
Leominster	.....	.....	.....	7.32	
Lowell a	86	38	57.0	7.68	
Lowell b	86	36	55.2	.....	
Ludlow Center	77	28	55.8	5.32	
Middleboro	81	36	54.1	7.57	
Monson	84	32	57.0	7.19	
New Bedford a	78	38	54.2	8.57	
Pittsfield	86	32	56.8	6.56	
Plymouth *1	85	30	55.6	8.54	
Princeton	.....	.....	.....	6.85	
Provincetown	74	37	53.0	10.49	
Somerset *1	82	42	57.4	7.54	
Springfield Armory	82	37	57.1	5.26	
Taunton	80	34	53.6	7.70	
Webster	.....	.....	.....	6.45	
Westboro	86	31	56.6	6.93	

TABLE II.—*Climatological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Massachusetts—Cont'd.	°	°	°	*Ins.*	*Ins.*
Weston	84	35	55.2	8.28	
Williamstown	81	35	55.6	4.98	
Winchendon	.....	.....	.....	6.15	
Worcester	85	37	56.3	5.53	
Michigan.					
Adrian	84	31	56.0	2.53	
Agricultural College	81	33	55.2	2.42	
Allegan	84[4]	30[1]	56.4[4]	1.11	
Alma	84	32	54.9	2.27	
Ann Arbor	85	34	56.4	1.72	
Annpere	83	32	57.8	1.90	
Arbela	82	32	55.8	3.71	
Baldwin	80	27	56.7	1.75	
Ball Mountain	85	34	56.0	3.40	
Baraga	78	30	56.2	.....	
Battlecreek	80	34	56.8	2.58	
Bay City	82[2]	32	56.2[6]	2.35	
Benzonia	83	30	53.6	1.88	2.0
Berlin	79	32	54.6	4.30	
Berrien Springs	86	33	56.1	1.59	
Big Rapids	81	26	55.0	2.01	
Birmingham	84	34	57.1	2.59	
Boon	85	25	52.4	2.55	1.0
Calumet	81	33	52.3	1.09	T.
Carsonville	78	35	55.4	2.16	
Cassopolis	85	37	59.1	2.34	
Charlevoix	77	29	51.4	2.34	
Chatham	82	26	50.0	3.72	
Cheboygan	74	29	52.0	3.35	
Clinton	81	32	56.4	2.91	
Coldwater	84	34	56.6	1.78	
Deerpark	72	29	46.8	1.38	
Detour	75	31	51.7	1.68	
Dundee	85	33	56.8	3.09	
Eagle Harbor	70	31	48.1	2.40	
East Tawas	75	31	55.8	1.89	
Eloise	86	34	57.4	2.91	
Ewen	90	21	54.3	1.51	
Fairview	82	33	53.2	1.86	
Fennville	87	27	56.7	1.85	
Fitchburg	82	33	55.6	5.65	
Flint	81	34	55.6	4.01	
Gaylord	79	18	51.6	4.10	T.
Gladwin	81	29	55.4	2.60	
Grand Marais	74	28	49.4	1.87	T.
Grand Rapids	83	35	58.2	3.47	
Grape	85	32	56.6	3.04	
Grayling	84	32	55.0	3.75	T.
Hanover	82	34	56.0	3.07	
Harbor Beach	73	35	50.8	2.18	
Harrison	.....	31	.....	2.72	
Harrisville	70	32	50.5	3.26	
Hart	84	29	55.2	1.77	
Hastings	81	31	56.4	2.03	
Hayes	81	31	54.2	1.41	
Highland Station	.....	.....	.....	2.95	
Hillsdale	83	33	55.6	2.64	
Humboldt	79	29	51.2	3.18	T.
Ionia	84	32	57.9	2.30	
Iron River	76[7]	20	53.0[4]	2.66	T.
Ishpeming	80	28	52.4	3.14	
Ivan	80	28	53.4	3.12	T.
Jackson	86	35	57.7	2.81	
Jeddo	80	32	53.8	2.09	
Kalamazoo	81	32	57.3	2.25	
Lake City	84	28	54.6	1.75	
Lansing	80	34	55.8	2.67	
Lapeer	81	34	54.8	2.97	
Lathrop	80	27	51.0	4.44	
Lincoln	74	30	52.0	1.10	
Ludington	79	24	52.6	0.76	
Mackinac Island	70	32	50.8	1.93	
Mackinaw	70	32	52.5	1.71	
Madison	86	32	58.0	2.07	
Mancelona	85	28	54.1	2.69	T.
Manistee	78	32	52.7	2.21	
Manistique	71	31	50.8	2.74	
Menominee	68	31	49.7	3.22	
Midland	87	.....	.....	.....	
Mio	81	28	53.7	2.57	
Mount Clemens	85	32	55.6	2.00	
Mount Pleasant	84	30	51.4	1.79	T.
Muskegon	82	33	56.4	1.22	
North Marshall	79	32	55.8	2.20	
Old Mission	79	33	53.0	2.84	
Olivet	78	35	55.8	2.69	
Omer	77	.....	.....	1.23	
Onaway	80	28	53.9	3.17	T.
Ontonagon	.....	26	.....	0 40	
Ovid	80	34	56.0	3.22	
Owosso	87	32	57.2	3.60	
Petoskey	80	35	52.6	2.92	T.
Port Austin	75	30	52.1	1.50	
Reed City	82	31	57.8	2.21	T.
Roscommon	.....	.....	.....	4.15	
Saginaw	83	33	56.6	1.85	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Michigan—Cont'd.	°	°	°	*Ins.*	*Ins.*
St. Ignace	71	33	50.8	1.67	
St. Joseph	77	33	53.8	1.12	
Sidnaw	85	20	50.2	2.85	T.
Somerset	81	33	54.4	2.22	
South Haven	84	38	52.9	2.82	
Thomaston	82	20	53.6	1.01	
Thornville	81	37	56.2	3.58	
Traverse City	76	32	52 3	1.71	T.
Vassar	81	32	55.7	3.41	
Wasepi	84	33	56.2	2.53	
Waverly	89	27	55.9	2.34	
West Branch	76	32	53.8	2.43	
Wetmore	78	23	49.0	3.65	
Whitecloud	83	29	58.0	.....	
Whitefish Point	75	30	46.5	0.96	
Williamston	80	32	56.0	3.22	
Ypsilanti	85	33	55.8	3.65	
Minnesota.					
Ada	95	29	58.5	0.22	
Alexandria	87	30	57.6	0.85	
Ashby	87	29	59.1	1.13	
Beardsley	91	25	58.2	1.35	
Beaulieu	92[5]	28[6]	58.2[6]	0.14	0.4
Bemidji	90	29	59.1	4.97	1.1
Bird Island	90	29	59.6	2.48	T.
Blooming Prairie	89	29	57.8	1.40	
Brainerd	90	33	58.2	1.23	
Caledonia	90	32	58.6	2.91	
Collegeville	88	32	58.3	1.36	
Crookston	90	30	58.0	0.26	T.
Currie	93[4]	28[4]	59.3[4]	.....	
Deephaven	.....	.....	.....	1.92	
Detroit City	90	27	57.2	0.83	
Faribault	87	30	61.9	0.90	
Farmington	90	32	59.8	1.67	
Fergus Falls	87	29	58.6	0.89	T.
Glencoe	88	18[1]	58.8	1.20	
Grand Marais	.....	.....	.....	1.32	
Grand Meadow	94	30	59.5	3.37	T.
Hallock	94	28	58.2	0.05	T.
Hovland	.....	.....	.....	1.39	
Lake Jennie	89	33	60.8	1.38	
Lakeside	87	29	58.8	1.50	
Lake Winnibigoshish	83	28	56.8	0.73	
Leech	88	29	56.1	0.45	
Long Prairie	88	28	57.2	1.44	T.
Luverne	86	31	59.3	3.25	
Lynd	89[6]	25[6]	60.0[6]	1.79	
Mapleplain	92	31	59.3	1.31	
Milaca	88	30	56.8	0.55	
Milan	92	29	59.0	1.36	
Minneapolis *a*	91	31	59.7	1.89	
Minneapolis *b*[1]	89[6]	32	59.2	1.76	
Montevideo	95	28	59.4	1.23	
Morris	94	30	60.2	2.15	
Mount Iron	84	25	55.1	1.60	1.0
Newfolden	89	23	56.9	0.76	
New London	92	2	59.0	1.50	
New Richland[*1]	86	38	59.0	.....	
New Ulm	93	31	60.6	2.10	
Park Rapids	87	29	55.8	1.11	0.4
Pine River	87	29	56.2	1.28	0.1
Pipestone	86	28	57.6	2.51	
Pleasant Mounds	90	30	58.4	1.76	
Pokegama Falls	86	24	54.1	1.14	
Redwing *a*	.....	.....	.....	1.12	
Redwing *b*	92	35	61.0	0.96	
Reeds	.....	.....	.....	1.08	
Rolling Green	86	30	58.4	2.30	
St. Charles	87	29	58.2	1.90	
St. Cloud	90	33	58.2	1.21	
St. Peter	89	30	59.6	2.07	
Sandy Lake Dam	87	30	56.8	0.66	
Shakopee	89	34	60.0	1.87	
Thief River Falls	.....	.....	.....	T.	T.
Tower	84	25	56.8	2.00	1.0
Two Harbors	81	29	48.0	1.42	T.
Wabasha[*3]	.....	40	60.9	1.14	
Warroad	89	29	55.2	0.60	0.5
White Bear	86	28	58.4	2.10	
Willmar	87	30	58.7	1.56	
Willow River	86	27	54.6	1.97	T.
Winnebago City	92	29	58.9	2.00	
Worthington	84	29	57.4	2.28	
Zumbrota[1]	88[6]	30	60.5	.....	
Mississippi.					
Aberdeen	95	38	67.8	3.75	
Agricultural College	95	46	70.4	3.87	
Austin	89	47	68.6	3.44	
Batesville	91	41	68.4	2.75	
Bay St. Louis	89	51	75.4	0.48	
Biloxi	90	54	75.2	1.42	
Booneville	88	45	67.4	3.96	
Brookhaven	95	47	72.5	3.45	
Canton	91	47	69.9	6.02	
Cleveland	.....	.....	.....	4.75	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Mississippi—Cont'd.	°	°	°	*Ins.*	*Ins.*
Columbus *a*	.....	.....	.....	4.42	
Columbus *b*	90	48	68.9	4.31	
Corinth	90	46	69.8	3.77	
Crystalsprings	92	48	71.5	4.32	
Edwards	95	49	73.2	12.20	
Fayette	91	42	70.9	1.78	
Fayette (near)[*1]	90	50	73.8	1.96	
Greenville *a*	91	55	72.8	5.68	
Greenville *b*	94	53	71.3	5.58	
Hazleherst	93	46	72.8	2.61	
Hernando	92	43	68.6	1.75	
Holly Springs	89	40	68.4	2.70	
Indianola	91	.....	.....	5.95	
Jackson	93	50	70.6	5.53	
Kosciusko	91	45	69.0	4.00	
Lake	90	41	67.4	3.35	
Leakesville	94	45	72.2	2.96	
Louisville	94	45	68.3	4.27	
Macon	93	44	70.1	4.73	
Magnolia	93	43	71.1	1.55	
Natchez	92	48	72.2	0.75	
Nittayuma	89	49	70.2	6.15	
Okolona	94	51	72.4	4.70	
Palo Alto	92	48	69.0	5.34	
Pearlington	92	47	73.4	0.49	
Pontotoc	91	43	67.6	5.07	
Poplarville	90	55	75.2	1.90	
Port Gibson	93	45	70.8	3.05	
Ripley	91	40	66.0	3.34	
Saratoga	93	42	70.9	6.81	
Shoccoe	.....	.....	.....	5.63	
Stonington[*1]	90	46	72.8	2.00	
Suffolk	.....	.....	.....	1.73	
Thornton	90	54	72.0	6.08	
Tupelo	.....	.....	.....	4.93	
Walnutgrove	89[6]	51[6]	71.8[6]	2.60	
Watervalley	.....	.....	.....	4.14	
Waynesboro	92	53	75.5	3.65	
Windham	94	43	72.0	11.75	
Woodville	91	49	73.2	0.93	
Yazoo City	93	46	71.2	6.08	
Missouri.					
Appleton City	92	40	65.2	2.07	
Arthur	85	37	63.0	2.54	
Avalon	88	36	63.6	0.85	
Bagnell	.....	.....	.....	0.25	
Bethany	86	31	60 0	1.41	
Birchtree	89	40	65.2	0.19	
Boonville	.....	.....	.....	1.16	
Brunswick	87	39	62.5	1.22	
Carrollton	87	42	62.2	2.13	
Conception	85[7]	35[7]	60.2[7]	2.03	
Cook Station	93	31	63.2	1.10	
Darksville	89	35	63.1	1.22	
Dean	91	37	65.8	1.21	
Desoto	92	37	64.2	2 23	
Downing	.....	.....	.....	0.51	
Edgehill[*5]	92	48	65.4	0.32	
Edwards	88	30	62 0	1.32	
Eightmile[*3]	.....	37	57.9	1.85	
Eldon	89	33	62.4	0.36	
Fairport	.....	.....	.....	1 59	
Fayette	90	34	63 6	0.34	
Fulton	88	33	63.2	0.40	
Galena	.....	.....	.....	0.78	
Gallatin[*1]	88	40	62.2	1.71	
Gayoso	92	42	67.4	1.74	
Glasgow	88	35	63.2	0.73	
Gorin	.....	.....	.....	1.77	
Halfway	86	35	63.0	1.06	
Harrisonville	88	38	63.2	2.28	
Hazlehurst	.....	.....	.....	1.31	
Hermann	.....	.....	.....	0.82	
Houston	92	34	62.8	0.24	
Irena	.....	.....	.....	2.39	
Ironton	92	34	63.6	0.47	
Jackson	92	36	63.8	1.93	
Jefferson City	93	36	65.8	0.65	
Kidder	86	37	61.2	2.91	
Koshkonong	90	39	66.6	1.83	
Lamar	89	38	65.4	2.38	
Lamonte	.....	.....	.....	1.04	
Lebanon	86	37	64.2	0.64	
Lexington	89	39	64.0	1.49	
Liberty	87	36	62.6	2.51	
Louisiana	93	35	64.6	1.16	
McCune[*1]	90	41	64.0	0.90	
Macon	92	37	64.8	0.45	
Marblehill	91	36	63.6	1.50	
Marshall	86	37	62.4	1.11	
Maryville	91	40	62.4	3.76	
Mexico	92	36	64.7	0.73	
Miami[*5]	87	46	65.8	0.81	
Mineralspring	87	36	65.4	0.76	
Montreal	88	30	61.7	0.36	
Mountaingrove	88	36	64.2	0.41	

TABLE II.—*Climatological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Missouri—Cont'd.	°	°	°	*Ins.*	*Ins.*
Mount Vernon	88	37	64.2	3.09	
Neosho	85	36	61.0	2.62	
Nevada				2.23	
New Haven	90	40	64.8	1.19	
New Madrid				2.38	
New Palestine	88	37	63.9	0.32	
Oakfield	89	40	64.0	2.04	
Olden	87	37	64.7	1.24	
Oregon *a*	88	40	62.8	2.67	
Palmyra *[5]	80	44	64.6	1.17	
Phillipsburg *[1]	85	43	64.4	1.00	
Pine Hill				1.07	
Poplarbluff	93	39	66.4	2.59	
Potosi	91	33	62.0	0.81	
Princeton	91	36	63.2	2.56	
Richmond	87	40	62.2	2.19	
Rockport				2.62	
Rolla				0.73	
St. Charles	90	38	62.9[e]	3.77	
St. Joseph				1.31	
Sarcoxie *[2]		48	63.4	2.34	
Sedalia				0.90	
Seymour	87	37	63.6	0.73	
Shelbina				0.90	
Sikeston	92	40	64.8	2.95	
Steffenville	91	36	64.3	0.65	
Sublett	90	32	62.5	0.29	
Trenton	85	39	63.2	1.81	
Unionville	98	38	64.1	2.14	
Vichy	89	36	64.0	0.42	
Warrensburg	89	39	64.5	1.78	
Warrenton	90	38	63.6	2.68	
Wheatland				1.22	
Willowsprings	86	36	63.4	2.28	
Windsor	86	37	62.3	1.65	
Zeitonia	93	37	64.4	0.33	
Montana.					
Adel	82	17	50.5	3.77	
Anaconda	84	27	53.2	2.27	
Augusta	82	22	53.8	4.13	
Billings	99	35	62.8		
Boulder	82	30	53.3	2.14	
Bozeman	84	33	54.2	5.01	
Butte	81	29	51.4	3.40	
Canyon Ferry	92	28	59.6	3.38	
Chester	89	25	56.7	2.42	
Chinook	98	19	60.4	2.78	
Clemons	82	25	52.2	4.46	T.
Columbia Falls	85	24	54.2	3.21	
Corvallis	89	24	58.4	3.70	
Crow Agency	94	35	62.2	2.65	
Culbertson	100	24	63.0	0.16	
Dell	82	28	53.6	1.32	
Dillon	87	38	60.5	2.48	
Fort Benton	88	32	59.4	4.34	
Glasgow	97	31	64.3	1.01	
Glendive	100	28	66.4	T.	
Glenwood	85	17	53.2	2.62	
Greatfalls	88	35	58.5	3.48	
Kipp	83	17	52.0	3.08	3.0
Lewistown	87	24	55.1	4.45	
Livingston	89	31	58.1	8.00	
Manhattan	86	31	57.0		
Martinsdale	86	24	56.0	3.90	
Marysville	80	25	51.8	3.52	
Missoula	89	28	59.1	3.84	
Ovando	84	19	52.0	2.80	
Parrot	85	37	56.2	2.49	
Plains	85	28	55.6	0.60	
Poplar	104	26	64.8	0.20	
Radersburg	87	31	64.8		
Ridgelawn	99	25	64.6	1.24	
St. Pauls	88	22	67.3	4.23	
St. Peter	84	30	52.2	8.48	T.
Troy	89	24	55.6	2.04	
Twin Bridges[c]	85	32	56.2		
Utica	91	24	56.2	3.82	
Wibaux	99	26	64.0	T.	
Yale	85	28	54.2	2.78	
Nebraska.					
Agate				2.06	
Agee *[1]	90	40	61.8	2.05	
Albion	88	32	59.2	1.76	
Alliance	90	35	59.2	3.90	
Alma	88	31	61.4	0.74	
Ansley	88	28	57.4	1.45	
Arapaho				0.79	
Arborville *[1]	86	38	59.6	1.80	
Arcadia				1.10	
Arlington				2.39	
Ashland *a*	88	36	62.0	2.96	
Ashland *b* *[1]	92	36	63.0	3.15	
Ashton				1.50	
Auburn	90	34	61.9	2.82	
Aurora	86	31	60.3	0.70	
Bartley				0.67	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Nebraska—Cont'd.	°	°	°	*Ins.*	*Ins.*
Beatrice	88	33	61.2	3.01	
Beaver	91	31	61.4	0.77	
Bellevue				2.40	
Benedict				2.97	
Benkleman				1.25	
Blair	90	38	61.0	1.58	
Bluehill *[1]	82	35	60.8	1.30	
Bradshaw				1.79	
Brokenbow *[1]	90	31	60.0	1.71	
Burchard				2.12	
Burwell				1.78	
Callaway	82	30	58.9	2.15	
Camp Clarke	89	32	60.0	2.63	
Central City				0.25	
Chester				2.06	
Coly				1.50	
Columbus	86	35	61.4	1.74	
Crete	85	36	61.6	1.53	
Cuibertson				0.63	
Curtis	90[e]	30[e]	61.6[e]	1.11	
Dannebrog				1.24	
David City	89	38	60.8	2.40	
Dawson	90	38	63.2	5.29	
Eden				3.68	
Edgar *a*				3.13	
Ericson				1.34	
Ewing				3.82	
Fairbury	88	33	61.2	2.09	
Fairfield	84	34	60.8	0.93	
Fairmont	86	33	59.6	2.49	
Fort Robinson	87	31	58.4	2.82	
Franklin	90	29	61.8	1.56	
Fremont	88	36	60.7	2.75	
Fullerton				0.50	
Geneva	87	33	60.6	2.55	
Genoa	85	36	61.2	1.68	
Gering	87	30	59.2	1.75	
Gordon				4.00	
Gosper				0.68	
Grand Island *a*	82	38	61.1	1.18	
Grand Island *b*	85	34	62.0	1.04	
Grand Island *c*	88	33	61.3	0.70	
Greeley				1.00	
Guide Rock				0.70	
Haigler				0.25	
Hartington	89	34	59.6	2.96	
Harvard	84	34	60.0	0.94	
Hastings *[1]	85	41	62.6	1.25	
Hayes Center				0.75	
Hay Springs	86	35	55.0	3.99	
Hebron	87	33	61.0	1.61	
Hickman				3.00	
Holbrook				0.40	
Holdrege	86	33	62.5	0.65	
Hooper *[1]	88	44	61.5	2.29	
Imperial	89	32	59.6	1.26	
Johnstown				2.58	
Kearney				1.64	
Kennedy	90	33	61.6	1.57	
Kimball	85	32	57.6	1.17	
Kirkwood *[1]	89	40	60.9	0.98	
Laclede				1.15	
Lena				3.08	
Lexington	86	30	58.9	1.18	
Lodgepole	88	32	58.3	3.50	
Loup				1.49	
Lynch	96	26	60.8	2.16	
McCook *[1]	85	40	61.4	0.13	
Madison	88	34	59.6	3.00	
Madrid				2.18	
Marquette				0.84	
Mason City				1.30	
Merriman				1.30	
Minden *a*	86	30	59.6	0.83	
Monroe				1.20	
Nebraska City *b* *[1]	86	46	64.3	2.95	
Nebraska City *c*	88	39	62.4	2.67	
Nemaha				3.75	
Nesbit	88	31	58.6	1.96	
Norfolk	89	32	61.0	3.02	T.
North Loup	89	32	61.1	2.32	
Oakdale	89	34	60.3	2.86	
Odell				1.96	
O'Neill	90	30	60.8	1.49	
Ord				2.30	
Osceola				0.00	
Ough				0.20	
Palmer				0.52	
Palmyra *[1]	88	46	61.2	1.51	
Plattsmouth *a*				2.13	
Plattsmouth *b*				2.27	
Pleasanthill				2.15	
Ravenna *a*	86	31	59.9	1.39	
Ravenna *b* *[1]	84	40	62.4	1.17	
Redcloud *b*	83	30	59.3	1.25	
Republican *[1]	88	38	61.8	0.65	

Stations	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Nebraska—Cont'd.	°	°	°	*Ins.*	*Ins.*
Rulo				5.20	
St. Libory				1.35	
St. Paul	88	31	61.1	0.86	
Salem *[1]	85	48	63.8	4.05	
Santee	92	32	61.6	2.19	
Schuyler				1.54	
Seneca *[1]	84	38	61.3	0.15	
Seward	88	34	61.4	1.34	
Smithfield				1.20	
Spragg				1.79	
Springview	88	32	60.9	1.69	
Stanton *[1]	85	41	59.9	3.45	
State Farm	90	33	62.0	2.10	
Strang				1.27	
Stratton				0.76	
Superior	87	35	61.4	0.75	
Syracuse				2.48	
Tablerock				2.86	
Tecumseh *b*	87	36	62.2	2.72	
Tecumseh *c*				2.95	
Tekamah	89	37	61.6	1.54	
Turlington	88	38	61.0	2.61	
Wakefield	89	33	59.2	2.71	
Wallace				1.61	
Wauneta				0.10	
Weeping Water				1.79	
Westpoint	90	35	60.4	2.70	
Whitman				0.85	
Wilber *[1]	86[e]	24[e]	61.6[e]	2.15	
Willard				1.10	
Wilsonville *[1]				0.63	
Winnebago				2.55	
Wisner				3.01	
Wymore				2.29	
York				2.98	
Nevada.					
Amos	83	24	56.2	0.19	
Austin	77	30	55.3	2.02	
Battle Mountain *[1]	82	40	57.4	0.00	
Belmont	79	26	52.2	0.62	T.
Beowawe *[1]	92	43	63.7	0.60	
Candelaria	86	32	56.6		
Carlin *[1]	88	40	62.5	0.00	
Carson City	82	28	53.8	1.68	
Cranes Ranch				1.19	
Elko (near)	80	32	54.4	0.45	1.0
Ely	84	29	53.7	0.85	T.
Fenelon *[1]	81	32	54.8	0.20	2.0
Golconda *[1]	89	34	56.9	0.81	
Halleck *[1]	87	38	57.9	T	
Hamilton	80	28	53.0	1.20	12.0
Hawthorne	83	35	59.2	0.39	
Hot Springs *[1]	86	40	61.7	T.	
Humboldt *[1]	83	44	62.8	0.36	
Lee				2.01	
Lewers Ranch	80	31	54.2	3.71	2.0
Lovelocks *[1]	86	41	61.0	0.56	
Martins	90	28	55.6	0.36	
Mill City				0.27	
Monitor Mill	79	22	49.9	0.70	0.2
Owyhee	74[k]	28	52.4[f]	1.45	
Palisade *[1]	94	37	60.0	0.20	
Palmetto	82	19	50.7	3.79	10.5
Potts	91	26	55.9	0.43	2.0
Reno State University	80	32	54.4	1.60	
Silverpeak	87	36	59.6	0.04	
Sodaville	91	37	59.9	0.88	
Tecoma *[1]	80	40	53.0	T.	
Toano *[5]	92	28	61.2	1.85	
Tybo	84	31	56.2	0.40	
Verdi *[1]	70	25	47.5	0.50	
Wadsworth *[1]	86	40	60.0	0.76	
Wells				0.30	
Wood	85	27	54.8	0.73	
New Hampshire.					
Alstead	81	31	55.1	5.81	
Berlin Mills	89	29	58.8	4.12	
Bethlehem	83	35	58.0	3.50	T.
Brookline *[1]	86	30	56.4	6.34	T.
Chatham	87	27	52.2	8.63	
Claremont	90	32	56.8	5.49	
Concord	88	29	55.2	6.09	
Durham	85	34	52.2	4.27	
Grafton	87	24	53.2	8.57	
Hanover	87	30	55.4	5.71	
Keene	86	29	55.8	5.48	
Littleton	83	30	52.5	5.86	T.
Nashua	90	30	55.4	6.05	
Newton	85	31	52.6	6.31	
Peterboro	84	28	53.4	5.65	
Plymouth	91	26	54.8	5.94	
Sanbornton	85	30	53.6	6.27	
Stratford	90	26	53.8	3.62	
New Jersey.					
Asbury Park	82	39	55.8	6.89	
Bayonne	87	40	58.4	6.74	

TABLE II.—*Climatological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
New Jersey—Cont'd.	°	°	°	*Ins.*	*Ins.*
Belvidere	86	37	60.0	5.24	
Bergen Point	84	40	57.5	7.68	
Beverly	86	39	60.0	5.45	
Blairstown	89	34	59.0	6.52	
Bridgeton	85	40	61.7	3.23	
Camden	82	41	59.8	5.01	
Cape May C. H.	78	38	58.0	4.01	
Charlotteburg	83	29	56.0	6.57	
Chester	82	33	55.4	5.19	
Clayton	83	39	59.8	3.57	
College Farm	85	37	59.2	5.01	
Deckertown	86	35	58.7	4.95	
Dover	86	34	56.8	6.09	
Egg Harbor City	81	34	58.6	4.93	
Elizabeth	89	38	58.6	6.92	
Flemington	83	37	59.8	6.29	
Freehold	86	36	58.2	5.92	
Friesburg	84	36	59.7	3.10	
Hanover	86	34	58.3	6.17	
Hightstown	85	39	59.0	5.09	
Imlaystown	89	39	61 7	5.31	
Indian Mills	90	34	60.2	5.77	
Lambertville	86	38	60.2	5.99	
Layton	86	32	57.2	5.56	
Moorestown	84	38	59.5	5.78	
Mount Pleasant				6.26	
Newark	86	38	57.2	5.95	
New Brunswick	87	38	60.1	5.02	
New Egypt				5.38	
Newton	84	34	58.6	5.24	
Oceanic	80[c]	38[c]	57.3[c]	6.77	
Paterson	89	31	59.9	7.34	
Perth Amboy	87	41	59.2	5.76	
Plainfield	85	35	57.8	5.16	
Rancocas				5.63	
Rivervale	84	33	57.2	8.13	
Roseland	83	34	56.6	6.29	
Salem	84	39	61.0	3.23	
Somerville	85	35	59.4	5.46	
South Orange	84	38	57.6	6.12	
Three Bridges				6.29	
Toms River	85	31	56.5	7.08	
Trenton	81	42	59.4	5.41	
Tuckerton	81	35	57.6	6.62	
Vineland	84	38	60.0	4.76	
Woodbine	81	35	60.0	6.20	
Woodstown				3.17	
New Mexico.					
Alamagordo				0.22	
Albert	86	43	62.8	5.14	
Albuquerque	87[c]	41[c]	64.5[c]	0.55	
Alma	85	30	59.2	1.75	
Beliranch				3.99	
Bernalillo	89	41	64.9	0.66	
Bluewater	89	30	57.4	0.90	T.
Cambray				0.05	
Deming				T.	
East Lasvegas	73	37	57.4	5.55	
Engle	90	34	65.2	T.	
Espanola	85	31	60.0	1.65	
Folsom	76	32	55.0	5.42	
Fort Bayard	85	35	61.6	T.	
Fort Stanton	83[c]	28[c]	57.6[c]	0.64	
Fort Union	78	32	55.0	5.92	
Fort Wingate	82	27	58.2	1.10	1.0
Gage				0.00	
Gallisteo	84	36	59.7	2.80	
Gallinas Spring	88	39	62.8	2.60	
Las Vegas	82	31	57.4	4.75	
Las Vegas Hotsprings	76	36	54.4	1.44	
Lordsburg				T.	
Los Lunas	92	40	66.2	0.85	
Lower Penasco	89	41	64.0	1.15	
Mesilla Park	96	36	68.6	T.	
Ollo	92	32	62.9	T.	
Raton	78	31	55.4	1.85	
Roswell	92	37	67.1	1.04	
San Marcial	105	43	71.2	0.00	
Socorro	93	37	66.8	0 72	
Springer	81	35	58.0	4.00	
Strauss				0.00	
Whiteoaks	85	37	60.9	1.68	
Winsors Ranch				3.18	
Woodbury		33		1.17	
New York.					
Adams				4.71	
Addison	84	34	56.6	4.94	
Adirondack Lodge	80	28	50.1	6.34	T.
Akron				4.85	
Alden	78	35	55.8	4.49	
Alfred	78	32	53.8	5.88	
Angelica	81	28	54.4	5.23	
Appleton	77	34	53.6	3.75	
Arcade	75	30	54.0	4.53	
Atlanta	78	33	54.0	5.97	
Atwell				5.37	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
New York—Cont'd.	°	°	°	*Ins.*	*Ins*
Auburn	80	34	58.4	4.27	
Avon	79	35	56.4	1.78	
Axton	83	26	52.2	4.64	T.
Baldwinsville	78	39	58.3	3.85	
Bedford *a*	83	36	58.0		
Blue Mountain Lake				5.00	
Bolivar	79	26	53.8	4.93	
Bouckville	76	35	55.0	5.79	
Boy s Corners				7.91	
Brockport	77	38	55.8	4.02	
Caldwell	79	33	55.4	4.57	
Canaan Four Corners	80	32	54.9	6.81	
Canajoharie	86	33	56.5	5.10	
Canton	82	34	55.8	5.77	
Carmel	82	37	57.8	7.49	
Carvers Falls	85	30	56.0	4.81	
Catskill	78	40	58.0	5.72	
Cedarhill	83	36	58.6	5.27	
Chenango Forks				6.20	
Cooperstown	78	34	54.6	4.94	
Cortland				3.25	
Cutchogue	77	35	54.8	7.31	
Dekalb Junction				4.80	
Easton				6.24	
Elba	79	35	55.4	5.13	
Elmira	80	38	57.6	4.82	
Franklinville	77	29	53.7	4.94	
Fulton				4.08	
Gabriels	86	30	52.7	4.18	
Glens Falls	85	37	57.6	3.05	
Gloversville	80	33	54.8	3.57	
Greenwich	82	31	56.8	4.86	
Griffin Corners	82	29	53.8	5.47	
Haskinville				6.58	
Hemlock	75	40	55.8	4.28	
Honeymead Brook	81	34	56.7	5.39	
Honnedaga Lake				6 80	
Humphrey	77	31	52.4	4.97	
Indian Lake	81	28	52.8	4.34	T.
Ithaca	76	35	55.8	4.20	
Jay	80	28	56.0	4.93	
Keene Valley	85[f]	32[f]	55.4[f]	5 72	
King Ferry				4.46	
King Station				5.73	
Liberty	81	37	54.8	4.66	
Littlefalls, City Res.	77	38	55.4	5.66	
Lockport	79	39	57.6	3.27	
Lowville	78	33	54.8	3.66	
Lyons	80	37	57.4[i]	2.42	
Mayle				3.15	
Meredith	77	32	53.9	6 05	
Middletown	81	41	58.0	6.90	
Mohonk Lake	77	40	55.3	8.75	
Moira	81	33	56.6	4.00	
Newark Valley				6.28	
New Lisbon	79	29	53.6	5.51	
North Germantown				6.16	
North Hammond	82	38	55.6	4.46	
Nu ber Four	80	28	53.4	3.46	
Nunda	83	32	56.6	5.67	
Ogdensburg	82	38	56.6	5.23	
Old Chatham				5.70	
Oneonta	81	34	57.2	4.54	
Oxford	80	30	55.6	7.69	
Palermo	78	33	55.8	3.08	
Penn Yan	78	41	56.8	4 44	
Perry City	80	31	54.9	4.80	
Plattsburg Barracks				4 38	
Port Byron	77	37	56.6	4.46	
Port Jervis	86	37	58.6	6 73	
Primrose	85	37	57.6	6.76	
Redhook				5.84	
Richmondville	83	34	55.6	5.22	
Ridgeway	74[d]	37[d]	55.6[d]	4.66	
Rome	77	35	56.2	5.56	
Romulus	79	36	57.1	5.37	
Salisbury Mills				5.93	
Saranac Lake	86	29	52.9	4.31	T.
Saratoga Springs	80	36	57.0	4.97	
Schenectaday	82	40	59.7	6.11	
Setauket	78	39	55.6	7.25	
Shortsville	77	36	55.6	3.56	
Skaneateles				4.46	
Southampton	78	36	53.8	5.61	
South Canisteo	78	30	53.9	5.15	
Southeast Reservoir				6.78	
South Kortright				4.97	
South Schroon	81	29	52.9	5.03	
Straits Corners	82	31	54.8	4.48	
Ticonderoga	79	40	56.4	4.06	
Volusia	77	35	54.2	4.29	
Walton	84	30	56.8	8.74	
Wappingers Falls	84	38	59.2	6.36	
Warwick				5.37	
Watertown	84	35	56.5	3.17	
Waverly	86	31	56.8	5.96	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
New York—Cont'd.	°	°	°	*Ins.*	*Ins.*
Wedgwood	75	36	54.2	4.82	
Wells	82	28	54.4	4.59	
West Berne	83	30	55.9	5.47	
West Chazy	79	33	56.0		
Westfield *a*	79	34	55.4	4.15	
Westfield *b*	79	37	55.3	4.76	
Westfield *c*	76	34	53.2	3.47	
Windham	82	30	54.0	5.02	
Wolcott				2.73	
North Carolina.					
Aberdeen	92	58	72.8		
Abshers	90	40	64.2	11.84	
Asheville				6.24	
Biltmore	90	45	65.4	6 35	
Bryson City				7.48	
Chapelhill	92	50	68.0	11.38	
Cherryville	92	44	67.5	8.67	
Currituck				5.10	
Durham	90	45	67.6	8.89	
Fayetteville	95	50	70.2	7.98	
Flatrock	88	36	61.2	10.97	
Goldsboro	92	54	69.4	7.69	
Greensboro	90	47	66.2	7.71	
Henderson	89	52	66.7	8.37	
Hendersonville	86	38	61.8	8 94	
Henrietta	95	47	68.2	9.00	
Highlands	77	32	57.3	6.61	
Horse Cove	82	39	62.7	9 74	
Kinston	94	44	70.6	6.51	
Lenoir	91	43	67.9	10.39	T.
Linville	76	32	55.7		
Littleton	91	46	65.0	9.45	
Louisburg	91	45	67.8	8.06	
Lumberton	92	49	72.1	12.52	
Marion	91	41	65.5	12.63	
Marshall	86	40	61.8	5.27	
Mocksville				6.80	
Moncure	92	47	68.8	9.53	
Monroe	93	44	66.3	7.20	
Morganton	89	44	65.4	6.70	
Mountairy	88	41	65.0	6.08	
Murphy				9.30	
Newbern	95	48	70.0	7.74	
Oakridge	89	48	65.8	8.63	
Patterson	86	42	60 2	11.85	
Pittsboro	92[f]	45	68.0[e]	8.66	
Redsprings	95	50	70.4	10.88	
Rockingham	93	49	69.8	10.55	
Roxboro	88	42	67.0	9.21	
Salem	92	45	66.6	5.70	
Salisbury	94	39	68.6	6.27	
Saxon	90	46	67.1	8.01	
Selma	97	48	69.0	5.97	
Settle	92	49	67.9	5.13	
Sloan	95	43	69.6	9.40	
Soapstone Mount	89	42	64.2	7.25	
Southern Pines *a*	97	52	72.2	8.88	
Southern P nes *b*	92	54	70.7	9.21	
Southport	96	52	70.8	6.11	
Springhope	90	55	67.2	7.20	
Statesville	92	44	65.0	6.98	
Tarboro	93[c]	46[c]	70.0[c]	5.54	
Washington	92	53	71.0	5.71	
Waynesville	83	35	59.4	9.63	
Weldon *a*	87	48	66.1	5.53	
Weldon *b*				5.51	
North Dakota.					
Ashley	91	21	59.0	0.89	
Berlin	95	21	56.2	0.35	
Bottineau	92	25	58.2	0.17	
Buxton	89	30	57.2	0.11	
Churchs Ferry	93	24	58.5		
Coalharbor	93	22	60.8	0.38	
Devils Lake	94	26	58.8	0.10	
Dickinson	96	24	62.9	0.13	
Donnybro k				0.32	
Dunseith	91	27	58.6	T.	
Ellendale	94	26	61.1	0.85	
Falconer	92	21	60.8	0.45	
Fargo	94	30	59.0	0.98	
Forman	97	24	59.0	0.66	
Fort Berthold	99	21	64.2	T.	
Fort Yates	94	27	63.2	0.18	
Fullerton	92	22	58.1	0.36	
Gallatin	90	26	58.6	0.73	T.
Glenullin	98[f]	23[c]	61.0[f]	0.44	T.
Grafton	95	29	60.3	T.	T.
Hamilton	93	26	56.6		
Hannaford	92	26	58.4	0.12	T.
Jamestown	91	30	62 1	0.13	
Langdon	94	28	57.4	0.33	
Larimore	92	27	56.6	0.17	
Lisbon	92	26	59.0	0.76	
McKinney	95	19	57.5	T.	
Mayville	96	31	60.4	0.40	
Medora	99	23	64.8	0.07	

TABLE II.—*Climatological record of voluntary and other cooperating observers*—Continued.

Stations	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
North Dakota—Cont'd.	°	°	°	*Ins.*	*Ins.*
Melville	90	23	60.0	T.	
Milton	88	26	56.7	0.20	
Minto	98	24	58.3	0.15	
Napoleon	93	19	59.9	0.20	
New England	92	19	60.8	0.06	
Oakdale	92	26	62.2	0.06	T.
Pembina	95	26	57.8	0.12	0.4
Portal	95	21	62.7	0.40	
Power	95	29	60.0	0.17	
Steele	95	21	61.1	T.	
University	90	30	58.2	0.28	T.
Valley City	93	27	60.2	T.	
Wahpeton	95	26	60.0	0.80	
Willow City	95	25	60.4	.....	
Woodbridge	93	25	56.0	0.65	
Ohio.					
Akron	84	35	57.5	3.45	
Annapolis	90	34	60.0	3.88	
Ashland	83	34	57.4	5.45	
Ashtabula	79	35	55.0	4.20	
Atwater	.....	.....	.....	3.93	
Bangorville	88	32	59.5	5.34	
Belfast	.....	.....	.....	3.35	
Bellefontaine	81	36	58.0	2.99	
Bement	.....	.....	.....	3.81	
Benton Ridge	85	34	57.7	3.70	
Bethany	88	38	62.0	3.99	
Bigprairie	87	34	57.2	4.34	
Binola	.....	.....	.....	5.53	
Bladensburg	86	30	58.1	2.67	
Bloomingburg	86	35	59.8	3.93	
Bowling Green	85	30	56.7	4.91	
Bucyrus	86	30	58.0	7.77	
Cambridge	85	33	60.3	4.51	
Camp Dennison	90	34	61.8	3.05	
Canaan	.....	.....	.....	4.45	
Canal Dover	85	33	58.6	3.12	
Canton	84	36	59.3	4.22	
Cardington	85	27	58.4	3.94	
Cedarville	.....	.....	.....	3.31	
Celina	85	35	58.3	4.79	T.
Chillocothe	89	36	61.9	4.77	
Circleville	86	36	60.3	4.95	
Clarksville	85	36	61.2	3.79	
Cleveland *a*	82	38	56.5	5.46	
Cleveland *b*	85	38	57.0	3.08	
Coalton	88	34	60.3	2.74	
Colebrook	82	30[1]	56.7°	2.85	
Dayton *a*	.....	.....	.....	3.04	
Dayton *b*	87	34	60.4	3.45	
Defiance	88	32	58.0	3.93	
Delaware	86	31	58.8	4.15	
Demos	85	37	60.2	2.92	
Elyria	86	34	57.2	5.19	
Findlay	89	35	59.5	4.65	
Frankfort	88	34	60.2	4.42	
Garrettsville	83	29	56.4	3.31	
Granville	85	35	59.2	4.01	
Gratiot	84	33	59.6	3.86	
Green	88	38	61.8	3.48	
Greenhill	82	30	57.0	4.03	
Greenville	82	38	58.6	2.85	
Hanging Rock	90	39	63.4	2.85	
Hedges	86	32	57.5	5.28	
Hillhouse	81	26	53.7	4.83	
Hillsboro	85	33	58.6	3.29	
Hiram	82	34	57.3	3.39	
Hudson	86	30	57.9	4.20	
Jacksonboro	88	39	61.0	1.90	
Lancaster	85	35	60.0	4.23	
Leipsic	85	.....	.....	3.95	
Lima	85	34	57.8	3.55	
Lowell	.....	.....	.....	4.71	
McConnelsville	87	35	60.8	5.81	
Manara	.....	.....	.....	3.71	
Mansfield	.....	.....	.....	7.18	
Marietta	86	41	62.9	4.42	
Marion	87	32	60.1	6.24	
Medina	83	33	58.0	5.74	
Milfordton	83	30	58.5	4.09	
Milligan	86	32	59.2	3.78	
Millport	83	30	58.1	3.09	
Montpelier	85	34	57.1	3.52	
Moorfield	87	33	58.4	4.45	
Napoleon	87	34	58.4	4.03	
New Alexandria	87	39	61.4	4.57	
New Berlin	83	33	59.2	3.94	
New Bremen	84	34	59.1	4.67	
New Holland	89	37	62.0	3.44	
New Lexington	.....	.....	.....	4.49	
New Paris	84	30	58.4	2.11	
New Richmond	86	39	61.4	3.19	
New Waterford	88	33	59.4	4.58	
North Lewisburg	86	35	59.0	3.45	
North Royalton	83	33	57.6	5.98	
Norwalk	88	31	58.1	5.46	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Ohio—Cont'd.	°	°	°	*Ins.*	*Ins.*
Oberlin	85	31	57.0	3.98	
Ohio State University	85	33	59.2	4.46	
Orangeville	83	30	57.9	4.07	
Ottawa	85	32	59.0	4.52	
Pataskala	84	33	59.2	4.50	
Philo	86	38	60.7	7.56	
Plattsburg	85	34	59.3	2.90	
Pomeroy	89	39	61.6	2.99	
Portsmouth *a*	.....	.....	.....	3.49	
Portsmouth *b*	90	43	63.6	3.43	
Pulse	.....	.....	.....	3.19	
Red Lyon	.....	.....	.....	2.20	
Richfield	.....	.....	.....	4.75	
Richwood	86	35	60.7	4.16	
Ripley	87	33	61.8	2.35	
Rittman	83	30	56.4	5.79	
Rock	.....	.....	.....	3.05	
Rockyridge	87	32	57.2	4.91	
Rosewood	84	32	58.4	3.07	
Shenandoah	84	30	56.5	5.66	
Sidney	89	35	61.5	3.46	
Sinking Spring	89	35	62.1	3.45	
Somerset	86	37	61.2	4.11	
Springfield	.....	.....	.....	2.84	
Strongsville	.....	.....	.....	5.14	
Swanton	.....	.....	.....	3.58	
Thurman	90	39	62.2	3.30	
Tiffin	84	35	57.6	5.74	T.
Upper Sandusky	87	34	59.0	3.40	
Urbana	83	38	59.2	2.61	
Vanwert	86	33	57.3	6.63	
Vermillion	83	33	56.5	3.16	
Vickery	85	30	56.6	4.57	
Walnut	.....	.....	.....	3.67	
Warren	.....	32	.....	3.32	
Warsaw	85	30	58.5	4.33	
Wauseon	86	32	57.0	3.67	
Waverly	90	37	62.8	4.05	
Waynesville	85	36	59.6	3.43	
Wellington	85	32	58.4	3.62	
Westerville	85	34	58.8	4.40	
Willoughby	.....	.....	.....	2.44	
Wooster	82	33	58.0	4.32	
Zanesville	.....	.....	.....	3.30	
Oklahoma.					
Arapaho	93	39	67.2	9.20	
Beaver	89	35	64.6	2.85	
Blackburn	91	40	65.4	5.60	
Burnett	92	42	67.8	6.45	
Clifton	93	40	67.3	3.21	
Fort Reno	88	40	67.3	5.61	
Fort Sill	94	44	68.8	4.98	
Hennessey	90	40	67.6	5.25	
Jefferson	90	38	65.0	2.49	
Jenkins	90	37	64.6	2.57	
Kenton	85	34	60.2	3.03	
Kingfisher	90	41	67.2	5.00	
Mangum	92	52	69.2	12.25	
Newkirk	87	44	67.8	4.54	
Norman	93°	44°	67.4°	6.74	
Pawhuska	96	42	67.6	4.93	
Perry	90	38	65.8	2.92	
Poarch	90	40	67.1	9.59	
Prudence	91°	39°	66.4°	5.98°	
Sac and Fox Agency	92	39	65.6	2.08	
Stillwater	90	43	67.8	4.70	
Taloga	93	43	68.8	6.15	
Texmo	.....	.....	.....	7.33	
Vittum	90	44	68.6	4.30	
Waukomis	93	41	67.2	5.63	
Woodward	93	40	67.6	4.06	
Oregon.					
Albany *a* [1]	82	45	58.8	1.80	
Albany *b*	.....	.....	.....	2.42	
Alpha	92	35	55.0	4.05	
Arlington	89	35	61.6	0.50	
Ashland *b*	82	30	56.2	1.74	
Aurora [1]	87	43	59.0	2.17	
Aurora (near)	87	34	55.8	3.22	
Bay City	77	31	52.4	6.38	
Bend	80	22	50.6	.....	
Beulah	93	25	57.7	1.44	
Blalock	93	38	63.3	0.89	
Brownsville [1]	90	44	55.3	2.44	
Bullrun	83	38	53.2	4.35	
Burns	82	26	54.8	0.12	
Burnes (near)	88	28	56.0	1.08	T.
Cascade Locks	90	43	60.2	2.66	
Comstock [1]	83	42	57.1	2.02	
Coquille	.....	.....	.....	2.20	
Corvallis	88	35	56.2	1.86	
Dayville	86	.....	.....	0.48	
Ella	.....	.....	.....	0.57	
Eugene	85	37	55.6	2.55	
Fairview	79	42	54.4	1.80	
Falls City	86	34	54.0	3.05	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Oregon—Cont'd.	°	°	°	*Ins.*	*Ins.*
Gardiner	77	35	54.1	4.56	
Glenora	89	32	52.0	4.92	
Government Camp	76	30	47.7	2.45	3.0
Grants Pass	87	30	57.0	0.80	
Hare	78	36	50.4	3.52	
Harris	86	35	55.2	1.90	
Hood River (near)	91	34	57.0	0.51	
Huntington	93	40	64.6	0.52	
Joseph	78	26	51.0	1.41	0.2
Junction City [1]	92	43	59.2	T.	
Kerby	87	34	56.2	1.90	
Klamath Falls	85	28	54.8	.....	
Lafayette [1]	91	44	58.4	2.28	
Lagrande	84	32	56.2	1.54	
Lakeview	81	28	53.8	0.69	T.
Lonerock	82	24	52.2	1.06	
McMinnville	88	34	55.7	2.40	
Merlin [1]	86	32	60.4	0.38	
Monroe	84	34	55.0	2.38	
Mount Angel	87	39	56.0	2.59	
Nehalem	.....	.....	.....	5.08	
Newberg	89	34	56.2	2.73	
Newbridge	83	30	59.8	1.50	
Newport	68	36	51.8	4.99	
Pendleton	90	32	60.2	1.42	
Placer	.....	.....	.....	1.50	
Prineville	91	21	54.9	0.37	
Riddles [1]	88	41	55.1	0.83	
Riverside	94	28	60.6	0.50	
Salem *b*	88	47	58.6	1.70	
Sheridan [1]	85	45	55.5	1.60	
Silverton [1]	90	48	59.2	2.50	
Siskiyou [1]	80	36	55.0	0.30	
Sparta	79	27	55.2	2.00	
Springfield [1]	78	42	55.6	5.44	
Stafford	88	36	55.4	3.42	
The Dalles	90	36	60.4	0.39	
Tillamook	.....	.....	.....	2.01	
Toledo	89	33	51.8	4.67	
Umatilla	.....	.....	.....	0.85	
Vale	89	27	59.4	0.65	
Westfork [1]	92	45	60.5	0.74	
Weston	83	29	56.2	1.69	
Williams	82	27	55.5	1.07	
Pennsylvania.					
Aleppo	85	34	60.0	5.90	
Altoona	86	34	58.0	5.85	
Athens	85	33	57.6	5.14	
Beaver Dam	.....	.....	.....	5.20	
Bellefonte	87	35	61.9	5.87	
Bethlehem	.....	.....	.....	4.56	
Brookville	.....	.....	.....	5.05	
Browers Lock	.....	.....	.....	4.58	
Butler	84	33	58.5	5.43	
Cassandra	83	32	56.3	5.83	
Coatesville	84	38	60.0	5.30	
Confluence	88	30	55.6	6.32	
Davis Island Dam	.....	.....	.....	6.16	
Derry Station	87	37	62.0	7.26	
Doylestown	.....	.....	.....	6.06	
Drifton	82	38	61.0	6.20	
Driftwood	.....	.....	.....	5.97	
Duncannon	.....	.....	.....	8.34	
Dushore	75	30	55.2	6.90	
East Bloomsburg	.....	.....	.....	5.59	
East Mauch Chunk	88	37	59.4	6.34	
Easton	83	39	60.4	5.89	
Ellwood Junction	.....	.....	.....	6.30	
Emporium	83	31	57.0	6.74	
Ephrata	86	40	60.5	3.94	
Everett	89	35	58.6	5.80	
Forks of Neshaminy [1]	80	48	58.5	5.83	
Franklin	83	31	57.4	4.00	
Freeport	.....	.....	.....	7.81	
Girardville	.....	.....	.....	5.59	
Grampian	84	34	59.7	3.51	
Greensboro	.....	.....	.....	7.00	
Hamburg	.....	.....	.....	6.55	
Hamlinton	81	31	55.0	7.96	
Herrs Island Dam	.....	.....	.....	5.61	
Huntingdon *a*	90	34	60.8	5.45	
Huntingdon *b*	.....	.....	.....	6.19	
Irwin	.....	.....	.....	4.84	
Johnstown	90	37	61.4	6.45	
Keating	.....	.....	.....	4.74	
Kennett Square	81	39	60.0	3.62	
Lansdale	.....	.....	.....	5.06	
Lawrenceville	80	31	56.2	3.90	
Lebanon	85	39	59.6	6.05	
Leroy	83	35	56.0	5.34	
Lewisburg	84	37	60.5	7.95	
Lockhaven *a*	88	37	62.5	7.11	
Lockhaven *b*	.....	.....	.....	7.42	
Lock No. 4	.....	.....	.....	5.68	
Lycippus	84	39	58.8	7.17	
Mifflin	.....	.....	.....	7.20	

TABLE II.—*Climatological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Pennsylvania—Cont'd.	°	°	°	*Ins.*	*Ins.*
Oil City	.....	.....	.....	5.14	
Ottsville	.....	.....	.....	4.88	
Parker	.....	.....	.....	5.25	
Philadelphia	84	43	61.1	4.71	
Point Pleasant	.....	.....	.....	5.59	
Pottstown	81	47	61.2	5.05	
Quakertown	84	36	59.2	4.86	
Reading[3]	.....	.....	60.7	3.38	
Renovo *a*	.....	.....	.....	5.46	
Renovo *b*	87	37	59.9	5.58	
Saegerstown	92	30	55.1	4.62	
St. Marys	80	35	55.4	6.93	
Seisholtzville	.....	.....	.....	4.96	
Selinsgrove	84	37	60.8	7.73	
Shawmont	.....	.....	.....	4.02	
Shinglehouse	87	31	56.2	5.18	
Smethport	79	28	54.4	5.16	
Smiths Corners	.....	.....	.....	5.46	
Somerset	82	32	56.8	7.23	
South Eaton	83	37	58.2	6.70	
State College	84	38	58.7	6.14	
Swarthmore	83	40	60.1	3.38	
Towanda	83	34	57.4	7.58	
Troutrun	.....	.....	.....	8.50	
Uniontown	84	40	60.0	6.25	
Warren	83	29	54.8	3.66	
Wellsboro	86	32	57.5	4.23	
Westchester	82	42	59.7	4.61	
West Newton	.....	.....	.....	4.60	
Westtown	82	38	58.7	3.16	
Wilkesbarre	88	38	59.2	5.36	
Williamsport	85	46	61.6	6.34	
York	91	39	61.2	2.55	
Rhode Island.					
Bristol	75	40	54.2	7.14	
Kingston	81	35	53.3	6.98	
Pawtucket	82	44	58.8	6.61	
Providence *a*	85	42	57.9	6.85	
Providence *c*	81	38	54.8	6.95	
South Carolina.					
Allendale	94	52	73.4	9.05	
Batesburg	96	48	71.6	5.94	
Beaufort	94	56	73.8	2.17	
Blackville	96	51	73.3	7.42	
Calhoun Falls	.....	.....	.....	9.17	
Camden	.....	.....	.....	6.28	
Cheraw *a*	93	51	70.6	10.19	
Cheraw *b*	.....	.....	.....	10.19	
Clemson College	93	44	68.8	7.16	
Conway	.....	.....	.....	8.02	
Darlington	.....	.....	.....	9.02	
Edisto	.....	.....	.....	8.15	
Effingham	.....	.....	.....	7.06	
Florence	93	52	73.4	8.36	
Gaffney	.....	.....	.....	5.14	
Georgetown	94	55	71.6	7.50	
Gillisonville	99	48	73.4	5.40	
Greenville	90	44	66.9	7.48	
Greenwood	95	40	70.8	8.31	
Kingstree *a*	91	47	70.9	5.26	
Kingstree *b*	.....	.....	.....	5.41	
Liberty	94	44	65.9	5.46	
Little Mountain	95	48	71.9	6.31	
Longshore	95	46	71.0	4.08	
McCall	98	52	72.0	9.28	
Pinopolis *[1]	90	53	71.3	5.69	
St. Georges	94	51	73.8	5.55	
St. Matthews	93	52	72.8	5.77	
St. Stephens	.....	.....	.....	6.69	
Santuck	97	48	70.4	5.46	
Shaws Fork	.....	.....	.....	8.63	
Smiths Mills	.....	.....	.....	9.97	
Society Hill	93	54	71.6	10.50	
Spartanburg	94	46	70.0	9.47	
Statesburg	93	50	72.9	9.42	
Summerville	92	51	72.2	4.93	
Temperance	99	52	72.0	11.69	
Trenton	90	58	73.6	5.88	
Trial	91	46	69.6	6.70	
Walhalla	93	43	67.2	5.26	
Winnsboro	91	48	71.0	12.09	
Winthrop College	93	49	69.7	13.08	
Yemassee	94	50	74.0	3.56	
Yorkville	96	49	71.7	8.03	
South Dakota.					
Aberdeen	95	23	61.5	1.00	
Academy	91	32	61.4	1.83	
Alexandria	93	28	60.2	2.70	
Armour	.....	28	.....	1.19	
Ashcroft	98	20	62.6	0.19	
Badnation	92	26	62.8	0.52	
Bowdle	92	24	59.2	0.63	
Brookings	87	25	57.0	1.80	
Bulkley	90	22	60.8	0.73	
Canton	89	29	59.0	3.10	
Centerville	.....	.....	.....	3.64	

Stations	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
South Dakota—Cont'd.	°	°	°	*Ins.*	*Ins.*
Chamberlain	92	35	65.1	1.33	
Clark	88	25[c]	58.4[d]	2.41	
Desmet	88	26	58.6	2.70	
Doland	88	29	58.4	2.86	
Elkpoint	92	33	62.0	2.39	
Farmingdale	.....	.....	.....	1.16	T.
Faulkton	94	24	60.4	1.17	
Flandreau	89	27	57.2	1.98	
Forestburg	92	26	60.8	1.95	
Fort Meade	91	32	61.8	2.83	
Fort Randall	97°	34°	62.8[c]	1.33	
Gannvalley	.....	.....	.....	2.47	
Gary	92	27	58.2	1.14	
Grand River School	96	24	62.3	0.21	
Greenwood	92	32	63.4	1.68	
Hartman	92	25	58.6	2.71	
Highmore	95	30	61.8	0.72[b]	
Hitchcock	.....	.....	.....	2.74	
Hotch City	92	24	60.9	0.66	
Howard	88	24	56.0	2.90	
Interior	96	30	66.8	0.18	
Ipswich	95	21	60.4	1.78	
Kimball	.....	.....	.....	1.35	
Leola	89	21	56.9	1.20	
Leslie	97	23	64.4	0.56	
Marion	90	28	60.0	3.17	
Mellette	92	24	60.8	1.27	
Menno	92	29	60.2	2.41	
Millbank	92	27	59.2	1.03	
Mitchell	91	30	60.2	1.92	
Mound City	93	26	61.0	0.58	
Oelrichs	89	29	59.4	1.55	
Pine Ridge	86	29	59.9	1.96	
Plankinton	89	28	59.4	1.68	
Redfield	90	24	59.0	2.06	
Rochford	84	18	52.6	2.37	
Rosebud	90	25	59.2	1.54	
St. Lawrence	.....	22	.....	2.34	
Silver City	.....	.....	.....	2.40	
Sioux Falls	89	31	58.2	1.82	
Sisseton Agency	87	25	57.8	3.64	
Spearfish	85	29	60.2	1.86	
Vermillion	90	32	61.7	2.60	
Waubay	89	23	57.4	1.98	
Wentworth	87[b]	28°	57.6[c]	2.33	
Wolsey	.....	.....	.....	1.84	
Tennessee.					
Andersonville	91	39	62.4	3.90	
Arlington	90	40	66.4	2.06	
Ashwood	90	40	64.2	1.60	
Benton	90	43	65.0	8.60	
Bluff City	.....	.....	.....	6.47	
Bolivar	90	41	66.2	1.63	
Bristol	86	42	62.4	6.16	
Brownsville	89	43	66.2	2.21	
Byrdstown	90	42	64.0	4.06	
Carthage	92	43	66.0	4.32	
Clarksville	88	46	65.0	6.36	
Clinton	.....	.....	.....	3.86	
Covington	93	45	69.8	2.27	
Decatur	92	43	65.3	7.17	
Dickson	91	42	65.8	1.47	
Dover	89	40	65.0	3.60	
Dyersburg	97	41	67.4	3.60	
Elizabethton	88	37	62.2	7.36	
Elk Valley	89	38	62.2	2.14	
Erasmus	88	35	59.4	5.60	
Florence	86	44	64.6	4.33	
Franklin	89	43	64.6	3.31	
Grace *[1]	92	46	67.7	6.50	
Greeneville	86	41	62.6	6.29	
Harriman	90	41	65.2	4.24	
Hohenwald	92	37	64.8	1.89	
Iron City	91	37°	64.8	1.59	
Johnsonville	93	37	64.5	3.00	
Jonesboro *[1]	83	49	62.4	7.56	
Kingston	.....	.....	.....	4.69	
Lafayette *[5]	92	43	63.0	2.25	
Lewisburg	90	43	63.4	1.70	
Liberty	93	44	68.4	4.25	
Lynnville	88	44	65.2	2.26	
Maryville	92	42	66.2	4.43	
Milan	92	41	66.8	1.80	
Newport	87	44	65.0	5.65	
Nunnelly	92	37	65.4	2.67	
Oakhill	91	40	64.0	5.36	
Palmetto	89	44	65.6	2.94	
Peryear *[5]	89	45	66.6	6.30	
Pope	92	38	65.0	1.84	
Rogersville	86	43	62.8	4.95	
Rugby	90°	34°	60.4°	3.91	
Savannah	91	42	66.4	4.10	
Sewanee	86	42	62.8	2.92	
Silverlake	.....	38	.....	8.17	
Springdale	91	30	62.9	4.46	
Springfield	93	38	64.8	1.50	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Tennessee—Cont'd.	°	°	°	*Ins.*	*Ins.*
Tazewell	.....	.....	.....	4.53	
Tellico Plains	91	43	65.4	7.52	
Tracy City	92	44	63.5	4.91	
Tullahoma	88	40	62.9	3.75	
Union City	89	40	65.5	1.30	
Waynesboro	90	38	60.8	2.00	
Wildersville	86	41	64.7	3.74	
Yukon	89	44	66.6	2.09	
Texas.					
Alvin	.....	.....	.....	0.24	
Anna	96°	41°	70.9°	2.50	
Anson	.....	.....	.....	5.60	
Arthur	.....	.....	.....	3.61	
Austin *[5]	93	48	72.2	.....	
Ballinger	99	46	71.2	3.25	
Beaumont	96	48	75.9	2.04	
Beeville	97	48	73.7	1.84	
Bigspring	.....	.....	.....	2.97	
Blanco	94	43	70.9	3.32	
Boerne	.....	.....	.....	3.74	
Booth	.....	.....	.....	0.33	
Bowie	98	46	72.9	6.23	
Brazoria	90	50	74.6	0.51	
Brenham	90	52	73.7	3.55	
Brighton	96	54	76.8	2.54	
Camp Eagle Pass	101	51	76.2	2.85	
Colorado	101°	53°	72.6°	3.04	
Columbia	89	47	73.4	0.90	
Comanche	99	44	72.2	1.85	
Corsicana	94	45	71.0	5.41	
Cuero	96	49	76.6	3.09	
Dallas	95	47	71.2	5.67	
Danevang	91	47	74.2	3.46	
Dublin	99	47	73.7	3.13	
Duval	93	52	72.9	3.38	
Estelle	96	46	71.4	6.25	
Fort Brown	99	.....	.....	0.80	
Fort Clark	96	49	74.2	1.80	
Fort McIntosh	102	57	82.2	0.27	
Fort Ringgold	99	57	81.5	0.73	
Fort Stockton	.....	.....	.....	0.12	
Fredericksburg	.....	.....	.....	2.25	
Gainesville	96°	43	69.0	5.66	
Georgetown	.....	.....	.....	4.76	
Grapevine	87	47	73.2	7.22	
Greenville[c]	94	44	71.1	4.10	
Hale Center	90	45	67.2	0.95	
Haskell	105	46	72.8	5.05	
Hearne	96	56	76.7	4.56	
Henrietta	96	47	70.8	11.50	
Hewitt	.....	.....	.....	2.72	
Hondo *[2]	95	.....	77.1	3.51	
Houston	92	50	74.8	0.40	
Huntsville	92	49	72.3	3.85	
Ira	100	45	70.5	3.15	
Jacksonville	90	45	70.8	3.35	
Jasper	90	52	74.6	2.96	
Kaufman	96	47	74.4	.....	
Kent	.....	.....	.....	0.23	
Kerrville	93	49	70.7	2.97	
Kopperl	.....	.....	.....	8.20	
Lampasas	98	43	74.4	2.42	
Llano *[5]	96	52	76.0	1.15	
Longview	93	51	73.4	5.55	
Luling	95	47	73.9	4.70	
Mann	89	46	70.0	8.60	
Menardville	98	42	72.2	3.59	
Nacogdoches	90	47	71.2	2.25	
New Braunsfelds	94	51	74.6	5.25	
Panter	.....	.....	.....	2.13	
Paris *a*	96	47	72.0	5.17	
Port Lavaca	88	59	75.8	2.41	
Rhineland	101	47	74.4	8.31	
Rockisland	89	50	73.4	2.23	
Rockport *[1]	81	59	72.2	.....	
Runge	98	47	77.5	4.15	
Sanderson	99	48	75.6	0.40	
San Marcos	95	50	73.8	3.14	
San Saba	99	42	73.8	0.97	
Sherman	91	50	71.8	7.47	
Sugarland	94	53	74.8	0.30	
Sulphur Springs	91	47	71.6	4.90	
Temple *a*	92	50	72.6	2.66	
Temple *b*	94	52	73.1	2.54	
Trinity	91	48	73.4	2.71	
Tyler	.....	.....	.....	4.12	
Valentine	98	44	74.2	0.00	
Victoria	.....	.....	.....	0.59	
Waco	95	50	74.6	4.50	
Waxahachie	97	45	72.4	6.25	
Weatherford	98	45	72.4	4.19	
Wichita Falls	.....	.....	.....	12.79	
Utah.					
Alpine	.....	.....	.....	4.07	
Aneth	91	38	65.6	0.30	
Blackrock	89	34	59.6	0.78	

TABLE II.—*Climatological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Utah—Cont'd.	°	°	°	*Ins.*	*Ins.*
Bluecreek	.....	.....	.....	0.28	
Castledale [f]	86	27	56.8	.....	
Cisco	88	38	63.4	0.58	
Corinne	96	34	64.4	1.88	
Deseret	89	32	61.0	1.90	
Emery	87	29	57.4	T.	
Farmington	89	38	62.2	4.77	
Fillmore	94	34	63.2	1.92	
Fort Duchesne	89	34	60.4	0.60	
Frisco	85	33	59.2	1.42	
Giles	89	33	64.4	0.44	
Government Creek	86	34	59.2	2.70	
Green River	98	38	68.0	0.73	
Grover	83	33	57.0	0.63	0.5
Heber	86	28	56.2	1.72	
Henefer	84	28	54.9	2.07	
Hite	98	46	73.0	.....	
Huntsville	.....	.....	.....	2.20	
Kelton	.....	.....	.....	0.25	
Lasal	80	31	56.0	1.68	12.0
Levan	85	33	59.2	1.74	
Loa	79	15	49 4	0.10	
Logan	84	34	60.6	2.43	
Manti	85	31	57.6	1.00	
Marysvale	85	27	56.3	0.54	
Meadowville	80	30	54.0	1.92	
Millville	.....	.....	.....	2.39	
Minersville	89	36	60.2	1.05	
Moab	94	38	66.6	1.19	
Mount Pleasant	85	34	56.9	0.58	
Ogden *[1]	90	45	62.2	2.36	
Park City	75	32	52.7	1.50	1.0
Parowan	88	30	57.6	0.88	
Pinto	82	28	53.4	0.85	
Promontory*[1]	80	46	62.8	.....	
Provo	89	35	61.0	0.39	
Richfield	75	25	50.9	0.10	
St. George	96	36	65.4	0.18	
Scipio	90	24	57.4	0.83	
Smithville	.....	.....	.....	T.	
Snowville	86	29	57.4	0.73	
Soldier Summit	90	20	52.9	0.21	
Terrace	.....	.....	.....	0.20	T.
Thistle	95	30	59.2	0.85	
Tooele	87	39	61.0	3.71	
Tropic	83	19	53.1	0.73	
Vernal	90	33	60.8	0.86	
Wellington	91	30	59.4	0.37	
Vermont.					
Bennington	84	33	57.6	4.41	
Burlington	80	40	58.4	3.96	
Chelsea	81	30	52.5	4.59	
Cornwall	82	34	55.6	4.10	
Enosburg Falls	88	28	55 2	2.88	
Hartland	85	30	54 3	6.53	
Jacksonville	82	27	56.5	5.84	
Manchester	81	32	54.0	5.09	
Norwich	86	28	56.0	6.25	
St. Johnsbury	83	30	55.8	3.40	
Vernon*[6]	82	42	55.9	4.66	
Wells	80	31	54.1	3.14	
Woodstock	82	29	51.8	6.64	
Virginia.					
Alexandria	85	43	64.0	2.20	
Ashland	90	45	66.4	6.46	
Barboursville	89[d]	44[e]	64.2[d]	10.28	
Bedford	91	44	66.1	4.99	
Bigstone Gap	89	39	62.5	5.80	
Birdsnest[2]	.....	.....	59.8	2.55	
Blacksburg	86	34	58.7	6.71	
Bon Air	89	48	64.4	4.19	
Buckingham [g]	95	36	64.4	6.47	
Burkes Garden	82	31	56.6	9.83	
Callaville	88	44	66.4	7.08	
Charlottesville	90	47	64.2	7.66	
Clarksville	.....	.....	.....	6.27	
Cliftonforge	86	32	59.4	5.65	
Columbia	92	38	66.0	7.50	
Dale Enterprise	88	37	61.2	5.11	
Danville	.....	.....	.....	6.45	
Doswell	89	38	63.9	4.08	
Farmville	90	40	66.2	9.97	
Fontella [h]	92	49	67.2	5.01	
Fredericksburg	87	43	64.4	3 89	
Grahams Forge	86[f]	35[e]	60.0[e]	10.12	
Hampton	87	47	65.0	2.59	
Hot Springs	84	34	58.4	7.74	
Lexington	88	38	62.6	4.61	
Lincoln	89	40	62.8	5.10	
Manassas	84	41	62.6	4.07	
Marion	88	35	62.2	6.80	
Newport News	89[e]	48[e]	66.4[e]	8.38	
Quantico	88	39	63.6	.....	
Radford	.....	.....	.....	7.11	
Salem	.....	.....	.....	8.21	
Speers Ferry	.....	.....	.....	5.73	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Virginia—Cont'd.	°	°	°	*Ins.*	*Ins.*
Spottsville	89	40	65.5	4.21	
Stanardsville	86	40	62.8	9.30	
Staunton	91	39	63.0	7.88	
Stephens City	88	40	62.2	6.11	
Warsaw	87	42	65.2	2.44	
Westpoint	86	40	62.2	.....	
Williamsburg	86	44	64.8	4.39	
Woodstock	88	39	60.2	5.44	
Wytheville	89	39	60.7	9.03	
Washington.					
Aberdeen	83	29	49.4	4.25	
Anacortes	.....	.....	.....	1.45	
Ashford	.....	.....	.....	4.80	
Bremerton	87	33	55.4	2.07	
Bridgeport [i]	97	34	62.4	0.55	
Brinnon	83	38	55.2	2.88	
Buchanan's Farm	.....	.....	.....	0.64	
Cedonia	83	31	55.1	2.08	
Centerville	87	30	53.8	1.11	
Cheney	.....	.....	.....	2.07	
Clearwater	80	32	50 8	8.68	
Cle Elum	83	27	52.2	0.59	
Colfax	90	31	58.1	1.53	
Colville	90	26	55.9	0.95	
Conconully	88	30	55.5	1.69	
Counell	.....	.....	.....	1.41	
Coupeville	78	37	52.6	0.85	
Crescent	86	27	55.4	0.98	
Dayton	85	30	58.0	1.18	
Ellensburg	88	28	54.8	0.88	
Ellensburg (near)	90	28	56.7	0.80	
Grandmound	86	31	54.4	2.46	
Granite Falls	.....	.....	.....	2.77	
Hooper	91	33	60.3	0.51	
Ilwaco	82	37	53.1	4.83	
Issaquah	.....	.....	.....	2.47	
Lacenter	92	35	55.9	3.35	
Lakeside	83	34	59.2	1.76	
Lind	99	31	60.4	0.91	
Loomis	95	42	63.5	.....	
Mayfield	65	32	49.4	3.34	
Monte Cristo	85	28	48.6	4.71	T.
Mottinger Ranch	90	38	62.8	1.50	
Mount Pleasant	87	38	55.4	3.23	
Moxee Valley	90	31	58.4	1.15	
Northport	96	33	60.0	1.75	
Olga	75	36	53.4	1.49	
Olympia	89	30	54.7	3.06	
Pasco	98	40	66.0	1.03	
Pinehill	90	33	58.2	0.35	
Port Townsend	77	38	52.2	0.60	
Pullman	86	35	56.4	1.47	
Republic	91[1]	24[1]	53.4[1]	2.48	
Ren on	.....	.....	.....	2.43	
Ritzville	.....	.....	.....	0.50	
Rosalia	83	31	55.4	1.44	
Sedro	85	29	54.6	3.49	
Silvana	81	31	53.2	1.86	
Snohomish	82	31	54.2	2.00	
Snoqualmie	89	32	55.1	2.79	
Southbend	88	31	51.5	4.16	
Sprague	.....	.....	.....	0.95	
Stampede	.....	.....	.....	3.80	T.
Sunnyside	90	32	59.2	0.84	
Twin	75	.....	.....	3.96	
Union	89	32	54.0	3.51	
Vancouver	86	38	56.0	2.29	
Vashon	78	36	53.5	2.84	
Waterville	87	31	54.3	1.46	
Wenatchee (near)	89	31	55.9	1.32	
Whatcom	74	33	53.0	2.59	
Wilbur	89	29	53.8	1.04	
West Virginia.					
Beckley	81	38	60.8	4.19	
Beverly	96	30	61.1	5.50	
Bluefield	85	39	60.8	8.86	
Buckhannon	88	33	60.0	7.03	
Burlington	90	34	60.8	6.97	
Byrne	87	43	63.7	6.59	
Camden	85	46	63.8	8.43	
Central	93	33	60.8	5.26	
Chapel	86	34	65.6	8.82	
Charleston	.....	.....	.....	5.40	
Clay	91	36	61.4	6.45	
Creston	92	33	62.9	4.92	
Dayton	87	33	59.8	5.56	
Elkhorn	88	40	61.6	7.89	
Fairmont	.....	.....	.....	6.24	
Glenville	89	35	61.8	5.49	
Grafton	85	34	59.1	6.50	
Green Sulphur	86	33	59.6	8.36	
Harpers Ferry	.....	.....	.....	7.81	
Hinton *a*	.....	.....	.....	5.91	
Hinton *b*	93	38	62.2	5.91	
Huntington	91	40	63.1	4.50	
Josiah	92	38	62.4	6.44	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
West Virginia—Cont'd.	°	°	°	*Ins.*	*Ins.*
Lewisburg	85	34	59.6	6 00	
Magnolia	95	35	62.4	4.28	
Mannington	88	32	61.6	5.74	
Marlinton	86	31	58.3	5.11	
Martinsburg	87	40	61.2	8.35	
Morgantown	85	39	61.6	6.10	
Moscow	88	34	61.0	5.30	
New Martinsville	90	37	63.2	5.07	
Nuttallburg	85	43	62.5	7.98	
Oceana	90	31	62.5	8.88	
Oldfields	91	39	63.0	7.83	
Parsons	84	30	58.4	2.50	
Point Pleasant	90	41	63.1	5.84	
Powellton	92	36	63.6	6.46	
Princeton	84	34	61.0	15.85	
Romney	93	35	62.2	6.34	
Rowlesburg	.....	.....	.....	2.71	
Southside	90	44	63.3	5.09	
Spencer	93	34	63.0	4.87	
Uppertract	90	33	60.8	5.46	
Wellsburg	82	39	59.5	6.81	
Weston *a*	.....	.....	.....	6.21	
Weston *b*	89	38	63.6	.....	
Wheeling *a*	.....	.....	.....	5.55	
Wheeling *b*	92	44	66.2	5.50	
Williamson	90	42	64.0	8.65	
Winfield	85	40	61.6	4.70	
Wisconsin.					
Antigo	82	26	55.7	.....	
Appleton	84	36	56.1	2.17	
Ashland	.....	.....	.....	2.00	
Barron	86	26	56.8	1.82	T.
Bayfield	80	34	51.5	0.97	
Beloit	87	37	58.4	2.43	
Brodhead	92	33	59.0	2.89	
Butternut	85	24	53.4	1.42	1.0
Chilton	86	31	55.4	1.40	
Citypoint	90	37	61.2	3.56	
Darlington	88	30	58.0	3.14	
Dodgeville	89	32	58.2	3.54	
Easton	89	30	58.9	2.14	
Eau Claire	91	35	60.2	2.26	
Florence	80	25	52.4	3.51	1.0
Fond du Lac	86	31	56.8	2.35	
Grand River Locks	.....	.....	.....	2.84	
Grantsburg	87	27	56.6	1.13	
Hartland	86	32	56.5	1.76	
Harvey	90	33	57.4	2.96	
Hayward	88	24	56.0	1.07	
Hillsboro	88	30	56.8	2.72	
Koepenick	82	25	52.6	1.70	
Ladysmith	87	28	57.9	0.48	
Madison	84	37	57.8	2.41	
Manitowoc	76	34	52.0	1.80	
Meadow Valley	92	32	57.8	2.75	
Medford	93	24	54.6	3.00	
Menasha	.....	.....	.....	1.59	
Neillsville	86	30	59.0	3.92	
New London	87	31	56.4	2.87	
North Crandon	81	24	54.0	1.35	T.
Oconto	78	32	54.6	3.13	
Osceola	89	26	56.6	1.74	
Oshkosh	80	35	59.8	.....	
Pepin	88	36	60.4	1.11	
Pine River	90	32	57.0	2.60	T.
Portage	91	34	60.0	2.59	
Port Washington	89	31	51.3	2.47	
Prairie du Chien *a*	92	37	62.5	1.38	
Prairie du Chien *b*	.....	.....	.....	2.02	
Prentice	86[e]	28[e]	53.8[e]	1.31	0.1
Racine	90	36	54.9	2.09	
Shawano	83	30	55.4	3.56	
Sheboygan	86	37	59.4	1.78	
Spooner	87[d]	21[d]	55.2[d]	1.20	
Stevens Point	90	32	59.8	2.04	
Valley Junction	89	31	59.1	2.59	
Viroqua	87	32	58.2	3.14	
Watertown	87	30	57.0	1.68	
Waukesha	85	36	55.7	1.88	
Waupaca	88	32	57.6	2.38	
Wausau	84	.....	.....	4.20	
Wausaukee	78[d]	29[d]	53.9[d]	2.59	
Westbend	92[f]	35[f]	57.8[f]	1.69	
Westfield	89	34	57.9	2.01	
Whitehall	87	32	59.2	1.70	
Wyoming.					
Alcova	97	32	60.6	1.57	
Basin	.....	.....	.....	1.59	
Bedford	83	28	53.1	2.68	
Bitter Creek	86	26	55.3	1.13	
Buffalo	89	30	60.0	2.34	
Burlington	90	34	59.9	2.00	
Casper	92	32	59.6	3.08	T.
Centennial	74	26	48.5	3.64	T.
Chugwater	81	29	54.6	2.65	
Daniel	77	23	48.0	0.96	

TABLE II.—*Climatological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Wyoming—Cont'd.	°	°	°	*Ins.*	*Ins.*
Embar	93	30	60.6	2.00	
Evanston	79	25	50.4	1.97	
Fort Laramie	88	30	60.2	4.29	
Fort Washakie	90	33	56.5	2.90	
Fort Yellowstone	78	29	52.2	2.72	
Fourbear	78	25	50.6	3.09	1.0
Griggs	91	28	58.2	4.81	
Hyattville	91	32	60.3	.....	
Iron Mountain	80	30	54.6	1.75	
Laramie	74	29	49.8	3.00	
Leo	84	27	52.4	2.66	
Lusk	85	27	55.8	2.98	
Myersville	83	29	53.0	1.01	
Parkman	90	30	57.8	3.28	
Pinebluff	84	30	56.5	1.34	
Rawlins	82	29	53.6	2.76	.....
Saratoga	89	29	55 4	1.93	
Sheridan	90	28	59.6	3.42	
South Pass City	88	30	52.2	2.55	1.5
Thayne	81	29	53.0	2.51	
Thermopolis	95	35	60.5	2.34	
Wheatland	85	33	59.7	2.95	
Cuba.					
Aguacate	96	50	81.9	8.89	
Alvarez	.....	.....	.....	11.21	
Anstralia	97	54	79.2	10.08	
Banaguises	92	51	74.5	15.87	
Batabano	96	56	77.8	7.17	
Camajuani	96	55	76.2	6.78	
Cruces	.....	.....	.....	7.90	
Gibara	96	55	77.7	10.47	
Guabairo	.....	.....	.....	7.87	
Guanajay	89	61	76.5	14.22	
Guantanamo	93	61	78.7	8.95	
Guines	93	62	77.0	9.81	
Holguin	100	59	79.7	5.97	
Isabel, Guantanamo	.....	.....	.....	4.66	
Los Canos	95	56	77.4	7.05	
Matanzas	93	52	72.8	20.27	
Moron Trocha	95	58	76.6	5.18	
Nuevitas	98[1]	69[1]	83.0[1]	4.76[1]	
Pinar del Rio	90	57	77.9	15.24	
Romelie, Guantanamo	.....	.....	.....	7.80	
San Ceyetano	95	55	75.8	9.00	
Sancti Spiritus	89	60	75.4	14.21	
Santa Clara	98	50	76.4	3.81	
Santa Cruz del Sur	87	58	76.4	2.18	
Soledad	90	58	76.6	6.03	
Soledad, Guantanamo	92	56	77.2	13.01	
Union de Reyes	92	60	78.4	11.60	
Yaguajay	98	58	79.2	7.04	
Porto Rico.					
Adjuntas	87	.....	.....	8.89	
Aguadilla	96	68	81.0	12.00	
Aguirre[1]	92	68	81.0	2.47	
Arecibo	91	67	78.2	8.25	
Barros	.....	61	.....	15.09	
Bayamon	96	65	80.4	13.23	
Caguas	90	61	77.5	5.34	
Canovanas	97	71	81.4	4.34	
Cayey	95	62	78.0	5.50	
Cidra	91	61	76.8	4.69	
Coamo	95	63	79.2	7.30	
C merio	91	63	78.1	8.47	
Corozal	94	62	78.4	11.90	
Fajardo	93	70	81.5	7.13	
Porto Rico—Cont'd.	°	°	°	*Ins.*	*Ins.*
Hacienda Amistad	93	64	79.4	6.30	
Hacienda Coloso	97	65	79.6	13.61	
Hacienda Perla	92	69	80.0	17.64	
Humacao	89	65	77.8	14.55	
Isabela	90	68	78.6	7.64	
Juana Diaz	92	60	79.2	5.44	
La Isolina	90	65	76.3	23.05	
Manati	95	63	79.9	8.18	
Maunabo	91	73	78.6	13.85	
Mayaguez	94	67	80.0	11.87	
Morovis	95	64	78.3	14.51	
Ponce	92	57	76.6	1.35	
San German	97	67	81.6	5.93	
San Lorenzo	95	65	79.4	6.15	
Santurce	.....	.....	....	4.97	
Utuado	93	65	79.4	17.91	
Vieques	91	69	82.0	7.50	
Yauco	88	69	79.8	3.78	
Mexico.					
Ciudad P. Diaz	97	58	77.8	2.40	
Coatzacoalcos	101	50	81.0	2.10	
Leon de Aldamas	92	50	71.3	0.01	
Puebla	84	48	68.7	1.98	
Tampico	93	68	80.8	1.71	
Vera Cruz	97	68	82.2	T.	
New Brunswick.					
St. John	69	33	49.4	3.94	
Isthmus of Panama.					
Alhajuela	91	70	77.9	15.87	
La Boca	88	73	80.2	7.01	

Late reports for April, 1901.

	°	°	°	*Ins.*	*Ins.*
Alaska.					
Coal Harbor	50	12	31.9	3.54	12.5
Fort Liscum	50	19	31.6	6.30	94.0
Kenai	51	10	33.0	0.85	13.0
Sitka	58	27	44.6	7.17	.....
Arizona.					
Fort Apache	.....	.....	.....	0.20	T.
Willcox	85	35	62.0	0.00	
California.					
Drytown	82	28	54.2	.....	
Glendora	....	.....	.....	1.59	
Florida.					
Federal Point	87	41	62.9	1.11	
Illinois					
Albion	86	30	51.4	3.10	
Kansas.					
Columbus	86	27	53.8	2.94	
Massachusetts.					
Sterling	.....	.....	.....	10.03	
Missouri.					
Galena	.....	.....	.....	2.47	2.0
Nevada.					
Los Vegas	98	29	61.4	.....	
Tonopa[1]	72	19	42.0	0.00	
New Hampshire.					
Claremont	87	27	46.6	3.91	T.
Stratford	85	21	45.9	2.42	4.0
New Mexico.					
Las Vegas Hot Springs	74	13	46.2	0.45	5.0
New York.					
Nunda	83	25	44.4	6.97	28.0
North Carolina.	°	°	°	*Ins.*	*Ins.*
Horsecove	78	26	47.6	9.29	0.4
Ohio.					
Big Prairie	87	22	43.2	.....	.....
Pennsylvania.					
Greensboro	80	.....	.....	7.09	2.0
Pottstown	.....	.....	.....	4.84	
Texas.					
Camp Eagle Pass	98	37	69.3	6.45	
Fort Brown	93	43	70.2	0.00	
San Marcos	88	37	65.6	0.60	
San Saba	92	32	64.6	0.60	
Valentine	92	30	61.8	T.	
Virginia.					
Westpoint	79	32	49.4	5.90	
West Virginia.					
Parsons	80	20	45.0	2.50	10.0
Wisconsin.					
Westbend	86	24	46.9	.....	.....
Wyoming.					
Hyattville	80	17	44.8	0.07	.....
Nicaragua.					
Rivas	96	78	85.9	0.02	

EXPLANATION OF SIGNS.

* Extremes of temperature from observed readings of dry thermometer.

A numeral following the name of a station indicates the hours of observation from which the mean temperature was obtained, thus:

[1] Mean of 7 a. m. + 2 p. m. + 9 p. m. + 9 p. m. + 4.
[2] Mean of 8 a. m. + 8 p. m. + 2.
[3] Mean of 7 a. m. + 7 p. m. + 2.
[4] Mean of 6 a. m. + 6 p. m. + 2.
[5] Mean of 7 a. m. + 2 p. m. + 2.
[6] Mean of readings at various hours reduced to true daily mean by special tables.
[7] Mean from hourly readings of thermograph.
[9] Mean of sunrise and noon.
[10] Mean of sunrise, noon, sunset, and midnight.

The absence of a numeral indicates that the mean temperature has been obtained from daily readings of the maximum and minimum thermometers.

An italic letter following the name of a station, as "Livingston *a*," "Livingston *b*," indicates that two or more observers, as the case may be, are reporting from the same station. A small roman letter following the name of a station, or in figure columns, indicates the number of days missing from the record; for instance "[a]" denotes 14 days missing.

No note is made of breaks in the continuity of temperature records when the same do not exceed two days. All known breaks, of whatever duration, in the precipitation record receive appropriate notice.

CORRECTIONS.

April, 1901, page 194, under head of "Late reports for March," strike out all data for Sitka, Alaska, and enter 46, 17, 36.8, 7.80, 2.0.

April, 1901, New Mexico, Las Vegas Hot Springs, should read Las Vegas.

NOTE.—The following changes have been made in the names of stations: Missouri, Wylie, changed to Dean.

TABLE III.—*Resultant winds from observations at 8 a. m. and 8 p. m., daily, during the month of May, 1901.*

Stations.	Component direction from—				Resultant.	
	N.	S.	E.	W.	Direction from—	Duration.
New England.	*Hours.*	*Hours.*	*Hours.*	*Hours.*	°	*Hours.*
Eastport, Me	16	20	18	21	s. 37 w.	5
Portland, Me	19	24	17	13	s. 39 e.	6
Northfield, Vt	23	33	10	4	s. 31 e.	12
Boston, Mass	19	16	23	17	n. 63 e.	7
Nantucket, Mass	15	26	19	17	s. 10 e.	11
Block Island, R. I	14	23	23	19	s. 24 e.	10
New Haven, Conn	20	25	20	9	s. 66 e.	12
Middle Atlantic States.						
Albany, N. Y	21	30	11	12	s. 6 w.	9
Binghamton, N. Y†	9	6	13	11	n. 34 e.	4
New York, N. Y	17	20	25	14	s. 75 e.	11
Harrisburg, Pa†	4	5	15	9	s. 80 e.	6
Philadelphia, Pa	19	20	23	17	s. 80 e.	6
Scranton, Pa	21	15	25	17	n. 53 e.	10
Atlantic City, N. J	18	23	21	17	s. 39 e.	6
Cape May, N. J	19	23	20	11	s. 66 e.	10
Baltimore, Md	15	17	29	16	s. 81 e.	13
Washington, D. C	20	21	24	11	s. 81 e.	13
Lynchburg, Va	19	16	25	15	n. 73 e.	10
Norfolk, Va	14	24	27	11	s. 58 e.	19
Richmond, Va	19	21	27	11	s. 83 e.	16
South Atlantic States.						
Charlotte, N. C	15	19	21	18	s. 37 e.	5
Hatteras, N. C	15	20	21	14	s. 27 e	16
Raleigh, N. C	17	22	18	19	s. 11 w.	5
Wilmington, N. C	6	29	17	20	s. 7 w.	23
Charleston, S. C	6	28	10	29	s. 41 w.	29
Augusta, Ga	13	22	10	29	s. 65 w.	21
Savannah, Ga	7	26	4	23	s. 45 w.	27
Jacksonville, Fla	8	25	15	29	s. 39 w.	22
Florida Peninsula.						
Jupiter, Fla	7	25	18	24	s. 18 w.	19
Key West, Fla	23	16	22	14	n. 49 e.	11
Tampa, Fla	10	19	10	37	s. 72 w.	28
Eastern Gulf States.						
Atlanta, Ga	18	13	9	37	n. 80 w.	28
Macon, Ga†	9	10	5	14	s. 84 w.	9
Pensacola, Fla†	16	3	6	17	n. 52 w.	22
Mobile, Ala	19	22	2	34	s. 85 w.	32
Montgomery, Ala	18	14	4	39	n. 83 w.	35
Meridian, Miss†	9	8	3	17	n. 86 w.	14
Vicksburg, Miss	6	27	19	21	s. 5 w.	21
New Orleans, La	13	31	5	26	s. 49 w.	28
Western Gulf States.						
Shreveport, La	15	21	23	17	s. 45 e.	8
Fort Smith, Ark	16	15	26	18	n. 83 e.	8
Little Rock, Ark	17	20	18	21	s. 45 w.	4
Corpus Christi, Tex	9	37	30	4	s. 43 e.	38
Fort Worth, Tex	17	29	15	15	s.	12
Galveston, Tex	8	42	21	9	s. 19 e	36
Palestine, Tex	18	30	12	16	s. 18 w	13
San Antonio, Tex	18	23	33	7	s. 79 e.	26
Ohio Valley and Tennessee.						
Chattanooga, Tenn	12	19	6	41	s. 79 w.	36
Knoxville, Tenn	20	16	13	27	n. 74 w.	15
Memphis, Tenn	22	21	13	22	n. 84 w.	9
Nashville, Tenn	29	13	7	27	n. 51 w.	26
Lexington, Ky†	10	11	6	12	s. 80 w.	6
Louisville, Ky	23	22	5	23	n. 87 w.	18
Evansville, Ind†	11	7	8	11	n. 37 w.	5
Indianapolis, Ind	28	8	10	24	n. 35 w	24
Cincinnati, Ohio	24	15	15	23	n. 42 w.	12
Columbus, Ohio	22	14	18	21	n. 21 w.	8
Pittsburg, Pa	25	17	10	25	n. 62 w.	17
Parkersburg, W. Va	20	16	9	25	n. 76 w.	16
Elkins, W. Va	29	13	10	23	n. 39 w.	21
Lower Lake Region.						
Buffalo, N. Y	8	26	22	22	s.	18
Oswego, N. Y	10	24	22	21	s. 4 e.	14
Rochester, N. Y	14	20	22	22	s.	6
Erie, Pa	15	15	18	24	w.	6
Cleveland, Ohio	27	17	16	13	n. 17 e.	10
Sandusky, Ohio	17	14	31	14	n. 80 e.	17
Toledo, Ohio	18	13	25	19	n. 50 e.	8
Detroit, Mich	25	12	21	19	n. 9 e.	13
Upper Lake Region.						
Alpena, Mich	29	11	23	13	n. 29 e.	21
Escanaba, Mich	40	12	11	4	n. 14 e.	29
Grand Haven, Mich	25	12	19	18	n. 4 e.	13
Houghton, Mich.†	4	4	15	11	e.	4
Marquette, Mich	35	8	8	27	n. 35 w.	33
Port Huron, Mich	31	11	16	16	n.	20
Sault Ste. Marie, Mich	23	10	24	22	n. 9 e.	13
Chicago, Ill	31	11	25	11	n. 35 e.	24
Milwaukee, Wis	32	10	29	11	n. 39 e.	28
Green Bay, Wis	37	12	16	10	n. 77 e.	26
Duluth, Minn	40	2	34	7	n. 36 e.	47
North Dakota.						
Moorhead, Minn	22	22	28	11	e.	17
Bismarck, N. Dak	16	21	33	8	s. 79 e.	25
Williston, N. Dak	16	30	21	6	s. 47 e.	20
Upper Mississippi Valley.						
St. Paul, Minn	32	12	23	13	n. 27 e.	22

Stations.	Component direction from—				Resultant.	
	N.	S.	E.	W.	Direction from—	Duration.
Upper Mississippi Valley.—Cont'd.	*Hours.*	*Hours.*	*Hours.*	*Hours.*	°	*Hours.*
La Crosse, Wis†	17	8	5	6	n. 6 w.	9
Davenport, Iowa	20	10	28	15	n. 52 e.	16
Des Moines, Iowa	27	11	25	15	n. 32 e.	19
Dubuque, Iowa	26	9	23	19	n. 13 e.	18
Keokuk, Iowa	29	15	14	18	n. 16 w.	15
Cairo, Ill	22	19	15	18	n. 45 w.	4
Springfield, Ill	22	15	21	21	n.	7
Hannibal, Mo†	12	5	11	10	n. 8 e.	7
St. Louis, Mo	23	12	17	20	n. 15 w.	11
Missouri Valley.						
Columbia, Mo*	12	8	6	10	n 45 w.	6
Kansas City, Mo	27	17	18	14	n. 22 e.	11
Springfield, Mo	26	16	16	15	n. 6 e.	10
Lincoln, Nebr	27	17	25	10	n. 56 e.	18
Omaha, Nebr	28	12	20	13	n. 24 e.	18
Valentine, Nebr	17	26	24	8	s. 61 e.	18
Sioux City, Iowa†	17	8	10	7	n. 18 e.	10
Pierre, S. Dak	14	24	36	5	s. 72 e.	33
Huron, S. Dak	20	17	32	10	n 82 e.	22
Yankton, S. Dak†	8	8	14	8	e.	6
Northern Slope.						
Havre, Mont	20	11	20	24	n. 24 w.	10
Miles City, Mont	20	20	25	14	e.	11
Helena, Mont	17	21	10	34	s. 81 w.	24
Kalispell, Mont	14	17	15	24	s. 72 w.	10
Rapid City, S. Dak	12	25	23	16	s. 28 e.	15
Cheyenne, Wyo	21	22	13	20	s. 82 w.	7
Lander, Wyo	15	22	18	23	s. 36 w.	9
North Platte, Nebr	13	25	25	15	s. 40 e.	16
Middle Slope.						
Denver, Colo	17	26	13	15	s. 13 w.	9
Pueblo, Colo	17	15	23	25	n. 45 w.	3
Concordia, Kans	20	14	20	16	n. 34 e.	7
Dodge, Kans	28	16	22	12	n. 40 e.	16
Wichita, Kans	24	20	19	9	n. 68 e.	11
Oklahoma, Okla	26	19	18	12	n. 41 e.	9
Southern Slope.						
Abilene, Tex	19	24	25	10	s. 72 e.	16
Amarillo, Tex	19	26	20	17	s. 23 e.	8
Southern Plateau.						
El Paso, Tex	15	9	14	35	n. 74 w.	22
Santa Fe, N. Mex	19	18	24	14	n. 84 e.	10
Flagstaff, Ariz	17	22	5	36	s. 81 w.	31
Phoenix, Ariz	13	8	25	23	n. 22 e.	5
Yuma, Ariz	9	27	11	26	s. 40 w.	23
Independence, Cal	24	13	7	29	n. 64 w.	25
Middle Plateau.						
Carson City, Nev	18	9	8	34	n. 71 w.	28
Winnemucca, Nev	17	22	12	26	s. 70 w.	15
Modena, Utah	11	15	10	37	s. 82 w.	27
Salt Lake City, Utah	21	18	23	14	n. 72 e.	10
Grand Junction, Colo	15	20	29	14	s. 72 e.	16
Northern Plateau.						
Baker City, Oreg	26	23	12	17	n. 59 w.	6
Boise, Idaho	21	17	13	28	n. 77 w.	16
Lewiston, Idaho†	3	7	22	2	s. 79 e.	20
Pocatello, Idaho	14	25	16	22	s. 27 w.	12
Spokane, Wash	11	30	15	18	s. 9 w.	19
Walla Walla, Wash	10	41	9	13	s. 7 w.	31
North Pacific Coast Region.						
Astoria, Oreg	15	26	4	39	s. 73 w.	37
Neah Bay, Wash	3	21	13	40	s. 56 w.	32
Port Crescent, Wash*	0	5	6	24	s. 74 w.	19
Seattle, Wash	14	29	22	15	s. 25 e.	17
Tacoma, Wash	18	22	5	25	s. 79 w.	20
Portland, Oreg	21	22	16	21	s. 79 w.	5
Roseburg, Oreg	34	7	21	15	n. 13 e.	28
Middle Pacific Coast Region.						
Eureka, Cal	30	12	12	24	n. 34 w.	22
Mount Tamalpais, Cal	25	5	3	46	n. 65 w.	47
Red Bluff, Cal	23	27	19	6	s. 73 e.	14
Sacramento, Cal	7	42	11	21	s. 16 w.	36
San Francisco, Cal	2	12	3	53	s. 79 w.	51
South Pacific Coast Region.						
Fresno, Cal	41	1	4	39	n. 41 w.	53
Los Angeles, Cal	7	10	14	38	s. 81 w.	24
San Diego, Cal	17	15	7	39	n. 87 w.	32
San Luis Obispo, Cal	19	7	1	37	n. 72 w.	38
West Indies.						
Basseterre, St. Kitts Island	8	8	52	1	e.	51
Bridgetown, Barbados	10	14	52	0	s. 86 e.	52
Cienfuegos, Cuba						
Grand Turk, Turks Island, W. I†	5	10	21	1	s. 76 e.	21
Havana, Cuba	18	9	39	7	n. 74 e.	33
Kingston, Jamaica	37	11	16	10	n. 13 e.	27
Port of Spain, Trinidad	3	11	52	2	s. 81 e.	51
Puerto Principe, Cuba	16	16	36	6	e.	30
Roseau, Dominica, W. I	14	17	54	10	s. 83 e.	24
San Juan, Porto Rico	2	29	41	2	s. 55 e.	47
Santiago de Cuba, Cuba	28	22	19	6	n. 65 e.	14
Santo Domingo, S. Domingo, W. I.						
Willemstad, Curaçao	1	2	60	0	s. 89 e.	60

* From observations at 8 p. m. only.

† From observations at 8 a. m. only.

TABLE IV.—*Thunderstorms and auroras, May*, 1901.

States.	No. of stations.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total. No.	Total. Days.	
Alabama	52	T.	....	....	....	....	....	7	....	....	....	....	1	8	2	1	2	3	2	3	4	2	2	....	1	1	5	....	....	1	1	7	11	64	19	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Arizona	56	T.	....	3	1	....	..	1	....	....	....	....	....	1	6	5	3	3	1	....	....	....	....	....	....	1	2	11	....	1	5	1	3	48	16	T.
		A.	....	....	....	....	..	..	....	....	....	....	....	..	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Arkansas	57	T.	....	....	....	1	5	....	....	....	....	4	6	13	4	....	2	13	9	9	4	3	1	3	....	11	....	....	5	....	7	6	9	115	19	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
California	167	T.	4	....	....	....	1	....	1	....	....	....	2	1	3	....	....	....	....	1	....	....	....	....	4	11	20	5	7	5	1	....	....	66	14	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Colorado	81	T.	10	11	4	2	4	2	5	1	2	1	6	11	12	15	18	13	9	7	7	10	5	5	1	2	5	8	10	12	19	10	6	233	31	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	A.
Connecticut	31	T.	....	1	1	....	....	....	....	....	....	3	6	1	4	....	1	....	....	....	....	....	....	....	....	10	....	....	....	....	....	....	....	27	8	T.
		A.	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Delaware	5	T.	....	....	....	....	....	....	....	....	1	....	2	1	1	1	..	....	....	1	....	1	....	....	1	1	1	....	....	....	1	1	2	15	13	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Dist. of Columbia	4	T.	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	1	....	1	4	4	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Florida	47	T.	1	....	....	....	2	....	3	5	8	1	....	2	3	6	3	1	5	5	4	9	5	5	5	4	7	12	5	....	....	....	5	106	23	T.
		A.	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Georgia	55	T.	....	....	....	....	11	5	4	2	2	2	1	6	3	4	....	....	14	9	11	6	4	....	....	2	9	8	....	3	1	6	11	124	22	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Idaho	34	T.	2	1	1	....	3	....	2	....	2	....	4	6	5	6	1	....	5	1	1	....	1	1	1	1	....	8	7	6	1	....	....	66	22	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Illinois	92	T.	....	6	...	....	32	8	....	1	7	16	6	....	....	....	....	....	3	11	1	4	1	5	14	6	..	....	2	1	...	2	....	126	18	T.
		A.	....	1	....	....	....	....	1	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	3	A.
Indiana	58	T.	4	1	....	....	7	12	4	1	14	7	10	....	....	....	....	....	....	12	....	5	....	....	6	14	2	..	....	....	....	9	....	108	15	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Indian Territory	11	T.	....	....	4	3	....	....	....	....	2	2	....	2	6	4	8	9	7	5	5	1	....	....	....	3	....	1	....	....	1	5	4	72	17	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Iowa	149	T.	1	4	1	14	39	5	6	1	....	7	....	....	....	....	1	4	....	....	....	....	1	5	9	....	....	....	....	....	....	....	....	98	14	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Kansas	77	T.	....	4	5	16	4	....	2	....	5	9	....	10	1	2	16	8	9	4	1	....	2	15	5	1	....	....	....	....	1	....	....	120	20	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Kentucky	41	T.	....	....	1	....	1	3	2	3	3	5	2	1	....	....	....	....	....	12	3	4	1	....	1	10	1	....	1	....	1	4	1	60	20	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Louisiana	46	T.	....	....	....	....	1	1	6	....	....	....	2	2	1	1	....	....	3	4	2	8	....	....	....	1	4	....	....	....	....	5	11	52	15	T.
		A.	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Maine	19	T.	....	....	....	....	....	....	....	....	....	....	....	3	....	....	....	....	..	....	....	....	....	....	....	1	1	....	1	....	....	....	....	6	4	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Maryland	48	T.	....	5	2	....	....	....	....	..	3	15	5	24	1	1	2	....	....	2	6	2	....	1	1	....	21	10	...	1	3	10	2	7	124	21	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Massachusetts	48	T.	1	9	2	....	....	....	....	....	....	2	1	2	1	....	....	....	....	....	....	....	....	1	....	20	....	....	....	....	....	....	....	39	9	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Michigan	106	T.	13	16	....	...	1	1	8	13	4	9	1	3	....	....	....	3	4	....	....	....	2	1	29	11	....	1	....	...	1	...	1	122	19	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Minnesota	67	T.	2	1	2	9	14	2	1	....	....	2	....	1	....	....	3	4	1	....	....	....	7	3	....	....	....	....	....	....	....	....	....	52	14	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Mississippi	44	T.	....	....	....	....	....	4	....	....	....	1	1	10	2	2	2	1	5	....	6	2	....	....	....	7	3	....	....	....	3	7	12	68	16	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Missouri	95	T.	....	....	1	14	14	3	2	1	1	3	7	....	1	...	5	10	13	4	4	5	8	6	11	2	....	....	3	....	....	2	....	120	22	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Montana	40	T.	3	3	....	....	....	2	4	1	....	..	..	5	3	7	1	1	5	5	3	4	....	4	1	2	....	6	8	9	8	6	1	92	23	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Nebraska	142	T.	....	7	11	26	4	2	....	....	6	1	..	....	3	5	9	4	2	....	....	....	....	2	3	....	....	....	....	....	1	....	....	86	15	T.
		A.	....	....	....	....	1	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	A.
Nevada	40	T.	1	2	....	2	1	1	....	....	....	2	6	4	6	6	1	....	....	....	....	....	1	....	1	8	1	2	6	5	2	....	....	58	19	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
New Hampshire	19	T.	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	8	....	....	1	....	....	....	....	13	4	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
New Jersey	51	T.	....	27	8	..	....	....	....	....	1	17	19	7	8	....	4	....	....	27	..	....	....	....	..	19	2	....	....	....	16	1	10	166	14	T.
		A.	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
New Mexico	31	T.	2	....	....	....	....	4	8	....	..	2	6	4	4	9	2	4	7	4	3	7	1	....	....	6	....	....	7	3	7	5	7	102	21	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
New York	99	T.	1	40	2	1	....	....	1	7	2	3	18	2	5	....	....	....	24	3	....	....	....	1	1	31	....	1	....	....	5	...	17	165	19	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
North Carolina	56	T.	4	....	2	....	2	16	16	23	12	22	5	11	4	9	....	9	5	21	12	7	4	1	1	8	15	5	3	7	....	5	....	229	26	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
North Dakota	48	T.	....	....	1	2	....	....	....	....	4	....	....	4	2	6	7	7	4	....	4	....	....	....	1	1	....	....	....	....	1	5	1	50	15	T.
		A.	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	A.
Ohio	128	T.	10	23	11	....	3	20	40	31	30	29	16	11	....	....	....	....	....	2	4	13	2	....	5	28	....	....	....	....	....	5	4	287	19	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Oklahoma	23	T.	....	....	1	2	....	....	....	....	4	....	....	4	2	6	7	7	4	....	4	....	....	....	1	1	....	....	....	....	1	5	1	50	15	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Oregon	74	T.	....	....	....	....	....	1	....	....	....	....	5	2	2	1	....	....	....	3	1	....	....	1	3	1	15	10	7	4	....	....	....	56	14	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Pennsylvania	91	T.	...	29	12	....	....	....	4	3	2	11	28	2	8	....	....	....	10	15	3	....	1	1	3	32	2	....	....	2	10	....	5	183	20	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Rhode Island	7	T.	....	2	....	....	....	....	....	....	1	1	....	1	1	....	....	....	....	....	....	....	....	....	....	5	1	....	....	....	....	....	....	12	7	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
South Carolina	46	T.	....	....	2	....	2	4	6	7	1	10	....	8	1	2	....	1	6	8	15	9	7	1	....	....	8	6	1	5	....	5	....	115	22	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
South Dakota	56	T.	....	3	4	5	2	....	....	...	6	2	...	....	1	3	5	3	....	....	....	....	1	1	1	1	....	. ..	....	....	1	....	. ..	39	15	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Tennessee	56	T.	....	....	....	....	1	5	4	4	7	3	3	4	....	....	1	1	4	12	5	1	4	1	1	12	1	....	1	2	1	10	2	9	24	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Texas	95	T.	1	1	3	4	....	1	3	3	....	3	5	5	....	2	4	8	10	5	8	3	1	2	2	9	2	...	....	1	8	11	5	110	26	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Utah	47	T.	1	1	....	2	1	....	1	1	....	....	4	8	14	13	9	8	4	....	....	1	2	....	....	1	4	16	11	6	10	....	....	118	19	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Vermont	16	T.	....	5	....	....	....	....	....	1	....	....	....	....	....	....	....	....	4	....	....	....	....	....	....	7	....	....	....	....	....	....	1	18	5	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Virginia	50	T.	8	1	....	....	....	2	2	10	12	10	1	3	1	1	....	2	5	2	1	....	....	....	....	8	9	....	1	5	3	...	4	91	20	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Washington	64	T.	...	....	....	1	....	....	....	....	....	....	....	....	....	....	1	1	....	2	....	....	4	1	....	....	2	10	6	1	....	....	29	10	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
West Virginia	43	T.	3	....	3	....	....	10	8	17	18	12	9	....	....	....	....	1	....	5	3	....	....	....	....	9	7	....	....	5	....	....	3	113	15	T.
		A.	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	A.
Wisconsin	60	T.	4	5	...	1	3	9	7	1	1	12	....	....	....	....	....	2	1	2	....	....	....	2	10	1	....	....	....	....	....	....	1	62	16	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Wyoming	31	T.	3	6	7	1	....	....	....	....	1	2	1	8	10	10	9	2	....	....	....	7	7	4	3	1	....	1	5	5	7	7	3	110	23	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Sums	2,893	T.	79	230	92	106	158	131	150	140	174	221	209	178	131	129	124	133	189	208	123	112	72	76	126	340	138	103	103	97	136	132	149	2,479	....	T.
		A.	0	1	0	0	1	1	1	0	0	0	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	....	A.

TABLE V.—*Accumulated amounts of precipitation for each 5 minutes, for storms in which the rate of fall equaled or exceeded 0.25 in any 5 minutes, or 0.75 in 1 hour during May, 1901, at all stations furnished with self-registering gages.*

Stations.	Date.	Total duration. From—	Total duration. To—	Total am't of precipitation.	Excessive rate. Began—	Excessive rate. Ended—	Amount before excessive began.	Depths of precipitation (in inches) during periods of time indicated. 5 min.	10 min.	15 min.	20 min.	25 min.	30 min.	35 min.	40 min.	45 min.	50 min.	60 min.	80 min.	100 min.	120 min.
	1	2	3	4	5	6	7														
Albany, N. Y.	2			0.48														0.36			
Alpena, Mich.	23-24			1.15														0.22			
Atlanta, Ga.	20-21	9.55 p. m.	1.03 p. m.	4.94	8.40 a. m.	9.50 a. m.	3.62	0.08	0.23	0.31	0.36	0.41	0.48	0.61	0.83	0.91	0.96	1.07	1.24		
Atlantic City, N. J.	10			0.69														0.45			
Baltimore, Md.	24-25	10.15 p. m.	D. N.	0.62	10.25 p. m.	10.40 p. m.	0.01	0.11	0.30	0.47	0.48										
Binghamton, N. Y.	24	3.14 p. m.	4.49 p. m.	0.56	3.42 p. m.	3.51 p. m.	T.	0.33	0.47	0.50											
Bismarck, N. Dak.	3			0.04																	
Boise, Idaho	1-2			0.21														0.08			
Boston, Mass.	24			0.76														0.32			
Buffalo, N. Y.	2			0.48														0.25			
Cairo, Ill.	18-19			1.12														0.47			
Charleston, S. C.	28	8.26 p. m.	D. N.	0.73	8.35 p. m.	9.05 p. m.	T.	0.04	0.09	0.23	0.39	0.56	0.63	0.65							
Chicago, Ill.	6			0.99														0.45			
Cincinnati, Ohio	20-21			0.67														0.13			
Cleveland, Ohio	27-28			1.05														0.16			
Columbia, Mo.	18-19			0.19														0.10			
Columbus, Ohio	7	3.20 p. m.	3.47 p. m.	0.53	3.25 p. m.	3.40 p. m.	T.	0.09	0.24	0.53											
Denver, Colo.	4			0.29														0.20			
Des Moines, Iowa	4			0.46														0.19			
Detroit, Mich.	23-24			0.47														0.23			
Dodge, Kans.	15			0.92														0.55			
Duluth, Minn.	22			0.55														*			
Eastport, Me.	12			0.29										0.29							
Elkins, W. Va.	10			0.81														0.54			
Erie, Pa.	25-26			0.67														0.15			
Escanaba, Mich.	21-22			0.80														0.28			
Evansville, Ind.	6			0.16						0.16											
Fort Worth, Tex.	16-17	8.35 p. m.	8.50 a. m.	1.43	8.40 p. m.	9.00 p. m.	0.02	0.06	0.15	0.32	0.53	0.55									
Fresno, Cal.	1-2			0.26														*			
Galveston, Tex.	30			0.39														0.33			
Grand Junction, Colo.	15			0.25														0.21			
Harrisburg, Pa.	24	6.10 p. m.	7.25 p. m.	0.81	6.40 p. m.	7.10 p. m.	0.03	0.21	0.34	0.43	0.55	0.67	0.74	0.77	0.78						
Do	28-29	9.30 p. m.	D. N.	1.01	10.26 p. m.	11.02 p. m.	T	0.18	0.30	0.41	0.52	0.67	0.72	0.76							
Hatteras, N. C.	10	9.50 p. m.	11.30 p. m.	0.86	9.50 p. m.	10.20 p. m.	0.00	0.12	0.40	0.53	0 59	0.69	0.83	0.87	0.89						
Huron, S. Dak.	5-6			0.73														0.10			
Indianapolis, Ind.	6			0.68														0.55			
Jacksonville, Fla.	21	1.45 p. m.	8.30 p. m.	1.04	3.18 p. m.	3.40 p. m.	0.23	0.16	0.37	0.49	0.58	0.60	0.63	0.66							
Jupiter, Fla.	21	8.40 a. m.	1.40 p. m.	1.44	11.10 a. m.	12.05 p. m.	0.01	0.11	0.19	0.23	0.39	0.43	0.47	0.54	0.65	0.77	0.86	0.91			
Kalispell, Mont.	19			0.69														0.29			
Kansas City, Mo.	4			0.20														0.19			
Key West, Fla.	20-21	4.04 p. m.	9.50 a. m.	1.72	3.50 a. m.	4.05 a. m.	0.38	0.20	0.45	0.58	0.62										
Knoxville, Tenn.	20-21			2.14														0.50			
Lexington, Ky.	20-21			1.34														0.29			
Lincoln, Nebr.	4-5	12.51 p. m.	D. N.	1.52	10.10 p. m.	10.45 p. m.	0.70	0.06	0.09	0.15	0.40	0.60	0.69	0.73	0.75						
Little Rock, Ark.	24			0.26														0.26			
Los Angeles, Cal.	1			0.79														0.40			
Louisville, Ky.	24			0.47								0.47									
Macon, Ga.	20	1.05 p. m.	2.25 p. m.	0.82	1.15 p. m.	1.35 p. m.	0.01	0.11	0.33	0.58	0.65	0.68	0.71	0.73	0.75						
Memphis, Tenn.	24	12.45 p. m.	2.15 p. m.	0.63	12.53 p. m	1.05 p. m.	T.	0.31	0.50	0.55	0.57										
Meridian, Miss.	31	D. N.	11.10 a. m.	1.99	2.00 a. m.	2.30 a. m.	0.01	0.13	0.22	0.39	0.53	0.59									
					3.35 a. m.	4.28 a. m.	0.68	0.17	0.20	0.21	0.25	0.69	0.75	0.76	0.81	0.89	0.96	1.03			
Milwaukee, Wis.	21-22			0.77														0.19			
Montgomery, Ala.	25	4.10 p. m.	5.30 p. m.	0.93	4.11 p. m.	4.50 p. m.	T.	0.08	0.15	0.22	0 43	0.57	0.71	0.80	0.91						
Do	31	2.30 a. m.	12.20 p. m.	2.39	5.25 a. m.	5.45 a. m.	0.35	0.25	0.58	0.75	0.81	0.84									
					6.25 a. m.	6.40 a. m.	1.36	0.21	0.64	0.69	0.70										
Nantucket, Mass.	27			0.66														0.39			
Nashville, Tenn.	18-19			2.42														0.48			
New Haven, Conn.	10			1.84														0.50			
New Orleans, La.	31	12.32 p. m.	1.25 p. m.	0.76	12.40 p. m.	1.00 p. m.	0.02	0.06	0.26	0.43	0.52	0.54	0.56	0.65	0.74						
New York, N. Y.	26-27			1.57														0.40			
Norfolk, Va.	26-27			0.86														0.28			
Northfield, Vt.	17-18			0.95														0.19			
Oklahoma, Okla.	15-16			1.20														0.54			
Omaha, Nebr.	4-5			1.36														0.32			
Parkersburg, W. Va.	21-22			1.30														0.38			
Philadelphia, Pa.	10			1.31														0.65			
Pittsburg, Pa.	2	7.55 p. m.	11.00 p. m.	0.60	9.20 p. m.	9.30 p. m.	T.	0.34	0.42	0.45	0.46	0.46	0.46	0.50	0.56						
Pocatello, Idaho	2-3			0.52														0.09			
Portland, Me.	10-11			2.05														0.62			
Portland, Oreg.	23			0.22								0.22									
Pueblo, Colo.	24-25			1.14														0.55			
Raleigh, N. C.	25	8.05 p. m.	11.45 p. m.	1.51	8.15 p. m.	8.55 p. m.	T.	0.13	0.48	0.75	0.88	1.00	1.08	1.12	1.19	1.21					
Richmond, Va.	8			1.26														0.52			
Rochester, N. Y.	28-29			0.31														0.16			
St. Louis, Mo.	18			0.93														0.56			
St. Paul, Minn.	6			0.42														0.23			
Salt Lake City, Utah	2-4			4.08														0.38			
San Diego, Cal.	1			0.19						0.15											
Sandusky, Ohio	20-21			0.82														0.18			
San Francisco, Cal.	20-21			0.46														0.14			
Savannah, Ga.	21			1.00														0.66			
Seattle, Wash.	15-16			0.98														0.18			
Spokane, Wash.	16-17			0.42														0.10			
Springfield, Ill.	5	5 45 p. m.	8.15 p. m.	1.06	6.20 p. m.	6.45 p. m.	T.	0.18	0.49	0.68	0.89	0.95	0.99	1.02							
Tampa, Fla.	24	2.20 p. m.	4.50 p. m.	2.55	3.25 p. m.	†	0.36	0.18	0.33	0.41	0.69	0.99	1.29	1.59	†	†	†	2.16†			
Toledo, Ohio	27-29			1.02														0.13			
Topeka, Kans.	22-23			0.15														0.12			
Vicksburg, Miss.	24-25	8.15 p. m.	11.10 a. m.	4.46	9.30 p. m.	10.15 p. m.	0.34	0.10	0.38	0.68	1.00	1.43	1.73	1.81	1.87	2.02	2 05	2.20	2.28	2.45	
Do	30-31	10.00 p. m.	D. N.	3.77	12.15 a. m.	2.15 a. m.	0.04	0.30	0.61	0.75	1.15	1.31	1.40	1.62	2.02	2 08	2.14	2.55	2.86	2.99	3.55
Washington, D. C.	8-9			0.56														0.25			
Wilmington, N. C.	19	6.35 p. m.	11.30 p. m.	1.34	8.50 p. m.	9.07 p. m.	0.12	0.06	0.31	0.90	0.95	0.96	0.98	1.00							
Yankton, S. Dak.	3-4			0.65														0.30			
Basseterre, St. Kitts.	18			0.35														0.30			
Bridgetown, Barbados	28-29			0.48														0.13			
Havana, Cuba	13	2.33 p. m.	3.11 p. m.	0.72	2.37 p. m.	3.00 p. m.	T.	0.19	0.37	0.52	0.65	0.71									
					3.45 p. m.	4.25 p. m.	0.53	0.10	0.31	0.50	0.66	0.74	0.83	0.98	1.06						
Do	20-21	11.24 a. m.	8.10 a. m.	6.66	9.35 p. m.	10.20 p. m.	3.47	0.06	0.17	0.28	0 41	0.45	0.48	0 62	0.75	0.81					
					2.35 a. m.	3.15 a. m.	5.14	0.12	0.40	0.52	0.74	0.78	0.85	0.89	0.96						
Do	22	1.02 p. m.	1.20 p. m.	0.72	1.07 p. m.	1.19 p. m.	T.	0.19	0.60	0.72											

TABLE V.—*Accumulated amounts of precipitation for each 5 minutes, etc.*—Continued.

Stations.	Date.	Total duration. From—	Total duration. To—	Total am't of precipitation.	Excessive rate. Began—	Excessive rate. Ended—	Amount before excessive began.	Depths of precipitation (in inches) during periods of time as indicated. 5 min.	10 min.	15 min.	20 min.	25 min.	30 min.	35 min.	40 min.	45 min.	50 min.	60 min.	80 min.	100 min.	120 min.
	1	2	3	4	5	6	7														
Kingston, Jamaica	15	.....	.....	0.13	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.13	.....	.....	.....	.....	.....	.....	.....
Port of Spain, Trin	24	10.06 a. m.	12.13 p. m.	0.90	11.35 a. m.	12.02 p. m.	0.26	0.08	0.21	0.35	0.48	0.60	0.74	.....	.....	.....	.....	.....	.....	.....	.....
Do	27	9.44 a. m.	10.58 a. m.	0.85	9.55 a. m.	10.15 a. m.	0.01	0.22	0.46	0.76	0.80	0.83	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do	30	8.06 a. m.	4.40 p. m.	1.17	8.50 a. m.	9.15 a. m.	0.08	0.04	0.32	0.49	0.61	0.65	...	.....	.....	.....	.....	.....	.....	.....	.....
Do	31	D. N.	7.40 a. m.	1.57	4.25 a. m.	5.30 a. m.	0.28	0.11	0.24	0.40	0.54	0.59	0.70	0.74	0.78	0.78	0.80	1.04	1.22	.....	.....
Puerto Principe, Cuba	12	4.11 p. m.	5.35 p. m.	0.98	4.14 p. m.	4.35 p. m.	0.01	0.33	0.50	0.63	0.71	0.77	0.79	.....	.....	.....	.....	.....	.....	.....	.....
Do	21	11.50 a. m.	5.15 p. m.	1.38	11.53 a. m.	12.20 p. m.	T.	0.09	0.30	0.46	0.64	0.74	0.79	0.83	0.86	0.89	.....	.....	.....	.....	.....
Do	22	10.45 a. m.	11.59 a. m.	1.07	10.45 a. m.	11.10 a. m.	0.00	0.06	0.42	0.69	0.83	0.88	0.90	0.92	0.97	1.02	.....	.....	.....	.....	.....
Roseau, Dominica	25	.....	.....	0.53	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.45	.....	.....	.....	.....	.....	.....	.....
San Juan, Porto Rico	6	10.36 a. m.	12.02 p. m.	0.83	10.47 a. m.	11.30 a. m.	T.	0.06	0.21	0.33	0.44	0.56	0.60	0.63	0.72	0.74	0.75	0.81	.....	.....	.....
Santiago de Cuba	14	3.52 p. m.	5.15 p. m.	1.10	3.57 p. m.	4.30 p. m.	T.	0.08	0.22	0.44	0.64	0.90	1.01	1.08	1.05	1.09	.....	.....	.....	.....	.....
Do	28	D. N.	11.33 a. m.	2.29	6.15 a. m.	6.40 a. m.	0.45	0.29	0.59	0.73	0.91	1.06	1.07	.....	.....	.....	.....	.....	.....	.....	.....
Willemstad, Curaçao	18	.....	.....	0.09	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.05	.....	.....	.....

*Self register not working. †Gage overflowed at 3:57 p. m.; estimated that 2.16 inches fell in 1 hour.

TABLE VI.—*Data furnished by the Canadian Meteorological Service, May*, 1901.

Stations.	Pressure. Mean not reduced.	Pressure. Mean reduced.	Pressure. Departure from normal.	Temperature. Mean.	Temperature. Departure from normal.	Temperature. Mean maximum.	Temperature. Mean minimum.	Precipitation. Total.	Precipitation. Departure from normal.	Precipitation. Depth of snow.
	Ins.	*Ins.*	*Ins.*	°	°	°	°	*Ins.*	*Ins.*	*Ins.*
St. Johns, N. F.	29.79	29.94	—.05	43.8	+ 0.9	51.0	36.6	2.38	—1.32	
Sydney, C. B. I.	29.92	29.96	—.01	48.1	+ 2.9	57.0	39.2	4.79	+0.46	
Halifax, N. S.	29.83	29.94	—.03	49.5	+ 1.1	57.0	42.0	5.57	+0.85	
Grand Manan, N. B.	29.86	29.92	—.06	48.4	+ 0.5	55.2	41.7	4.39	+0.86	
Yarmouth, N. S.	29.86	29.94	—.04	48.9	+ 1.3	56.0	41.9	5.13	+1.10	
Charlottet'n, P. E. I.	29.88	29.92	—.04	50.8	+ 3.9	59.4	42.3	3.43	+0.28	
Chatham, N. B.	29.90	29.92	—.03	51.8	+ 3.3	62.8	40.8	1.53	—2.37	
Father Point, Que.	29.87	29.90	—.05	46.2	+ 2.2	54.8	37.6	2.39	—0.04	
Quebec, Que.	29.56	29.89	—.06	53.1	+ 3.2	62.5	43.7	3.73	+0.61	
Montreal, Que.	29.67	29.87	—.06	56.7	+ 2.0	64.3	49.1	2.53	—0.55	
Bissett, Ont.	29.29	29.90	—.04	54.3	+ 2.0	67.7	41.0	3.06	+0.46	
Ottawa, Ont.	29.52	29.83	—.11	57.2	+ 2.3	67.2	47.1	3.91	+1.33	
Kingston, Ont	29.55	29.87	—.09	54.7	+ 1.8	62.6	46.8	3.73	+0.98	
Toronto, Ont	29.50	29.88	—.10	54.9	+ 1.7	63.9	45.9	3.54	+0.89	
White River, Ont.	28.65	29.99	+.01	50.7	+ 5.0	66.0	35.3	2.36	+0.75	T.
Port Stanley, Ont	29.24	29.88	—.09	53.4	+ 0.3	62.7	44.1	2.46	—0.38	
Saugeen, Ont.	29.18	29.90	—.06	52.0	+ 1.3	61.4	42.7	2.57	0.00	
Parry Sound, Ont	29.20	29.90	—.06	54.2	+ 3.0	65.2	43.3	3.33	+0.01	
Port Arthur, Ont.	29.28	29.98	+.05	49.2	+ 3.3	59.8	38.7	0.95	—1.23	
Winnipeg, Man.	29.21	30.02	+.08	58.2	+ 6.6	73.1	43.4	0.36	—2.46	0.5
Minnedosa, Man.	28.16	29.93	+.03	57.7	+ 9.3	72.8	42.6	2.29	+0.65	0.1
Qu'Appelle, Assin.	27.67	29.87	—.02	59.3	+ 9.5	73.4	45.1	0.81	—0.71	1.8
Medicine Hat, Assin.	27.62	29.88	+.01	58.7	+ 4.6	71.8	45.6	6.29	+5.13	
Swift Current, Assin.	27.36	29.88	—.02	59.7	+ 9.0	72.8	46.6	1.99	+0.50	
Calgary, Alberta	26.36	29.85	—.04	52.5	+ 3.5	66.8	38.3	1.91	+0.42	T.
Banff, Alberta	25.32	29.92	+.02	47.5	+ 0.5	60.1	34.9	2.39	+0.97	
Edmonton, Alberta	27.57	29.83	—.06	54.8	+ 4.0	66.7	42.8	2.02	+0.42	
Prince Albert, Sask.	28.33	29.84	—.05	57.7	+10.1	72.0	43.4	1.49	+0.28	
Battleford, Sask.	28.16	29.86	—.03	58.0	+ 7.0	71.1	45.0	2.42	+1.30	
Kamloops, B. C.	28.68	29.94	+.01	60.2	+ 1.1	73.7	46.8	0.00	—1.45	
Victoria, B. C.	29.92	30.02	+.01	52.6	+ 0.1	58.9	46.3	0.98	—0.55	
Barkerville, N. W. T.	25.58	29.87	.....	44.6	— 0.9	57.6	31.6	3.17	+0.50	2.0
Hamilton, Bermuda	29.86	30.02	—.01	71.5	+ 2.1	77.4	65.7	1.83	—2.94	

TABLE VII.—*Heights of rivers referred to zeros of gages, May, 1901.*

Stations.	Distance to mouth of river.	Danger line on gage.	Highest water.		Lowest water.		Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.		
Mississippi River.	*Miles.*	*Feet.*	*Feet.*		*Feet.*		*Feet.*	*Feet.*
St. Paul, Minn.	1,954	14	7.8	9–11	5.1	31	6.4	2.2
Reeds Landing, Minn.	1,884	12	5.2	6	3.8	31	4.6	1.4
La Crosse, Wis.	1,819	12	7.1	1	5.3	31	6.1	1.8
Prairie du Chien, Wis.	1,759	18	9.4	1	5.4	23	6.7	4.0
Dubuque, Iowa	1,699	15	10.0	1	5.6	31	7.0	4.4
Leclaire, Iowa	1,609	10	6.6	1	3.7	25-28,30,31	4.8	2.9
Davenport, Iowa	1,593	15	8.3	1	4.2	31	5.7	4.1
Muscatine, Iowa	1,562	16	10.0	1	5.5	31	7.2	4.5
Galland, Iowa	1,472	8	4.8	1,2	2.5	29–31	3.5	2.3
Keokuk, Iowa	1,463	15	8.6	1	4.1	29–31	6.0	4.5
Hannibal, Mo.	1,402	13	9.8	1	5.1	31	7.2	4.7
Grafton, Ill	1,306	23	12.5	1	7.0	31	9.6	5.5
St. Louis, Mo	1,264	30	15.2	1	9.4	25	11.8	5.8
Chester, Ill.	1,189	36	13.0	1	7.5	26	9.7	5.5
New Madrid, Mo	1,008	34	34.2	2,3	15.4	20, 21	23.1	18.8
Memphis, Tenn	843	33	32.1	6,7	12.3	23	21.6	19.8
Helena, Ark	707	42	41.6	9	18.1	24, 25	30.5	23.5
Arkansas City, Ark.	695	42	44.3	12, 13	23.0	30	35.6	20.3
Greenville, Miss	595	42	37.4	13	18.0	30	30.4	19.4
Vicksburg, Miss	474	45	41.5	15, 16	21.9	31	36.1	19.6
New Orleans, La	108	16	14.2	11	9.4	31	13.2	4.8
Missouri River.								
Bismarck, N. Dak.	1,309	14	9.8	28	1.6	1–3	5.6	8.2
Pierre, S. Dak.	1,114	14	9.2	28–30	2.6	1–6	5.2	6.6
Sioux City, Iowa	784	19	11.5	31	6.0	2–4	8.0	5.5
Omaha, Nebr	669	18	11.7	31	6.6	4	8.0	5.1
Plattsmouth, Nebr	641	18	7.3	31	3.4	4	4.6	3.9
St. Joseph, Mo.	481	10	6.0	31	1.9	3–5	3.2	4.1
Kansas City, Mo.	388	21	14.8	31	8.2	5	9.6	6.6
Boonville, Mo	199	20	9.3	26, 31	7.3	8	8.8	2.0
Hermann, Mo.	103	24	8.0	25, 26	6.1	28	6.9	1.9
Osage River.								
Bagnell, Mo.	70	28	3.2	1	1.4	31	2.2	1.8
Des Moines River.								
Des Moines, Iowa	165	19	5.4	1	4.0	18–31	4.5	1.4
Illinois River.								
Peoria, Ill.	135	14	10.9	1	6.9	31	8.6	4.0
Beardstown, Ill	70	12	5.3	1	1.9	31	3.5	3.4
Youghiogheny River.								
Confluence, Pa.	59	10	8.1	27	1.2	5–8	2.9	6.9
West Newton, Pa.	15	23	11.0	27	1.8	7	3.5	9.7
Allegheny River.								
Warren, Pa.	177	14	6.0	30	1.0	19–26	2.3	5.0
Oil City, Pa	123	13	7.2	30	1.5	20–22	2.8	5.7
Parker, Pa	73	20	8.7	29, 30	1.7	21, 22, 26	3.4	7.0
Monongahela River.								
Weston, W. Va.	161	18	6.8	27	−0.1	7–9	0.8	6.9
Fairmont, W. Va.	119	25	12.0	28	1.2	7, 8, 21	3.2	10.8
Greensboro, Pa.	81	18	15.8	28	7.6	8	9.6	8.2
Lock No. 4, Pa.	40	28	21.3	28	7.1	8	10.5	14.2
Conemaugh River.								
Johnstown, Pa.	64	7	8.0	27	1.8	16–18	3.0	6.2
Red Bank Creek.								
Brookville, Pa	35	8	2.2	29	−0.2	20–25	0.4	2.4
Beaver River.								
Ellwood Junction, Pa.	10	14	4.8	13	3.1	6,7	3.7	1.7
Great Kanawha River.								
Charleston, W. Va.	61	30	38.5	23	5.2	7,8	10.7	33.3
Little Kanawha River.								
Glenville, W. Va.	100	20	12.3	27	0.5	8,9	2.5	11.8
New River.								
Hinton, W. Va.	95	14	15.6	23	2.7	7,18	4.9	12.9
Cheat River.								
Rowlesburg, W. Va.	36	14	7.2	13	3.0	6–9, 19–22	4.2	4.2
Ohio River.								
Pittsburg, Pa	966	22	17.3	29	3.2	22	6.8	14.1
Davis Island Dam, Pa.	960	25	16.6	29	5.4	21, 22	8.2	11.2
Wheeling, W. Va.	875	36	25.0	30	6.7	21, 22	10.7	18.3
Parkersburg, W. Va.	785	36	25.0	31	7.4	21	11.4	17.6
Point Pleasant, W. Va.	703	39	34.5	30	8.0	21	16.8	26.5
Huntington, W. Va.	660	50	38.6	31	12.1	21	21.0	26.5
Catlettsburg, Ky	651	50	39.7	31	11.8	21	21.8	27.9
Portsmouth, Ohio	612	50	42.5	1	13.1	21	22.8	29.4
Cincinnati, Ohio	499	50	51.2	1	16.0	21	25.5	35.2
Madison, Ind.	413	46	45.7	1	14.5	11, 12, 22	22.4	31.2
Louisville, Ky.	367	28	30.4	1	7.8	21, 22	11.2	22.6
Evansville, Ind	184	35	41.8	1	11.3	14	21.6	30.5
Paducah, Ky.	47	40	39.4	1	10.8	18	21.9	28.6
Cairo, Ill	1,073	45	43.2	2	18.3	19, 20	28.1	24.9
Muskingum River.								
Zanesville, Ohio.	70	30	13.3	1	6.9	20	8.6	6.4
Scioto River.								
Columbus, Ohio.	110	17	4.8	22, 30	2.0	17–21	2.7	2.8
Miami River.								
Dayton, Ohio.	60	18	2.3	11	1.2	20	1.6	1.1
Wabash River.								
Mount Carmel, Ill.	50	15	7.5	1	2.5	28	4.1	5.0
Licking River.								
Falmouth, Ky.	30	25	11.0	23	2.0	19	3.7	9.0
Kentucky River.								
Frankfort, Ky.	50	31	14.1	24	6.2	20, 21	7.5	7.9
Clinch River.								
Speers Ferry, Va	156	20	19.8	22	0.5	18, 19	3.1	19.3
Clinton, Tenn.	46	25	26.0	24	5.1	19	9.0	20.9
Tennessee River.								
Knoxville, Tenn.	614	20	34.8	23	2.4	18	7.1	32.4
Kingston, Tenn.	534	25	24.5	24	3.5	16–19	6.9	21.0
Chattanooga, Tenn.	430	33	33.5	25	4.9	18	11.5	28.6
Bridgeport, Ala.	390	24	23.6	26	3.5	19	8.7	20.1

Stations.	Distance to mouth of river.	Danger line on gage.	Highest water.		Lowest water.		Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.		
Tennessee River—Cont'd	*Miles.*	*Feet.*	*Feet.*		*Feet.*		*Feet.*	*Feet.*
Florence, Ala.	220	16	16.2	28, 29	3.1	20	7.6	13.1
Riverton, Ala.	190	25	24.8	29	3.9	19	10.5	20.9
Johnsonville, Tenn.	94	24	22.7	31	5.1	20, 21	11.4	17.6
Cumberland River.								
Burnside, Ky.	434	50	26.0	28	3.0	18, 19	6.7	23.0
Carthage, Tenn	257	40	20.8	25	2.9	18	7.6	17.9
Nashville, Tenn	175	40	23.4	26	4.7	18	11.2	18.7
Clarksville, Tenn.	138	42	25.8	1	6.7	18	13.9	19.1
Arkansas River.								
Wichita, Kans.	726	10	2.5	1	1.7	29–31	2.0	0.8
Webbers Falls, Ind. T.	413	23	9.6	21	2.8	31	4.5	6.8
Fort Smith, Ark.	351	22	12.5	21	4.2	15	6.6	8.3
Dardanelle, Ark.	256	21	12.3	23	3.6	18	6.3	8.7
Little Rock, Ark.	176	23	13.0	24	5.2	20	7.8	7.8
White River.								
Newport, Ark.	150	26	12.1	1	2.5	31	5.3	9.6
Yazoo River.								
Yazoo City, Miss.	80	25	16.6	1,2	9.2	31	14.1	7.4
Red River.								
Arthur City, Tex.	688	27	25.6	20	4.0	7	10.9	21.6
Fulton, Ark.	565	28	27.7	25	5.2	9	13.6	22.5
Shreveport, La	449	29	15.5	31	4.5	20	9.3	11.0
Alexandria, La	189	33	13.7	1	4.3	23	8.7	9.4
Ouachita River.								
Camden, Ark	340	39	16.2	1	5.7	31	8.8	10.5
Monroe, La	100	40	24.6	7-9	12.2	31	20.0	12.4
Atchafalaya River.								
Melville, La.	100	31	31.4	16–19	25.5	31	30.4	5.9
Susquehanna River.								
Wilkesbarre, Pa.	178	14	14.1	31	3.4	10, 11	5.1	10.7
Harrisburg, Pa.	70	17	13.9	31	3.4	11	5.7	10.5
W. Br. of Susquehanna.								
Williamsport, Pa.	35	20	14.0	30	2.8	22	4.9	11.2
Juniata River.								
Huntingdon, Pa.	80	24	7.7	30	3.8	6–22	4.5	3.9
Potomac River.								
Harpers Ferry, W. Va.	170	16	13.0	23, 24	2.0	20, 21	5.7	11.0
James River.								
Lynchburg, Va	257	18	13.8	23	1.4	8, 9, 17–19	3.3	12.4
Richmond, Va.	110	12	19.2	24	−1.0	6,7	2.4	20.2
Roanoke River.								
Weldon, N. C.	90	40	45.7	25	8.9	18, 19	16.5	36.8
Cape Fear River.								
Fayetteville, N. C.	100	38	58.5	24	3.9	7	13.2	54.6
Edisto River.								
Edisto, S. C.	75	6	6.5	27	3.3	17–21	4.6	3.2
Pedee River.								
Cheraw, S. C.	145	27	33.5	23	2.9	16, 17	11.6	30.6
Black River.								
Kingstree, S. C.	60	12	11.8	30, 31	2.6	19	7.0	9.2
Lynch Creek.								
Effingham, S. C.	35	12	15.8	28	3.3	20	7.5	12.5
Santee River.								
St. Stephens, S. C.	50	12	16.0	31	5.2	20	8.4	10.8
Congaree River.								
Columbia, S. C.	37	15	22.2	24	0.8	{10, 11, 15, 17, 18}	4.0	21.4
Wateree River.								
Camden, S. C.	45	24	32.5	24	6.4	19	14.1	26.1
Waccamaw River.								
Conway, S. C.	40	7	5.1	2–4, 24, 25	2.3	16	3.9	2.8
Savannah River.								
Calhoun Falls, S. C.	347	.....	10.2	22	3.0	18	4.1	7.2
Augusta, Ga.	208	32	27.7	23	8.2	17, 18	11.8	19.5
Broad River.								
Carlton, Ga.	30	.....	7.9	22	2.5	5	3.4	5.4
Flint River.								
Albany, Ga	80	20	8.6	31	1.8	16	3.8	6.8
Chattahoochee River.								
Westpoint, Ga.	239	20	17.2	23	3.7	14	5.7	13.5
Ocmulgee River.								
Macon, Ga.	125	20	13.9	23	3.0	19	4.7	10.9
Oconee River.								
Dublin, Ga.	60	30	8.1	25	1.7	19	3.5	6.4
Coosa River.								
Rome, Ga	225	30	26.4	23	2.5	18, 19	6.8	23.9
Gadsden, Ala	144	18	19.0	26	2.6	1–19	6.7	16.4
Alabama River.								
Montgomery, Ala.	265	35	20.0	27	4.6	19, 20	9.4	15.4
Selma, Ala.	212	35	22.0	28	3.0	19, 20	9.7	19.0
Tombigbee River.								
Columbus, Miss.	308	33	6.7	22	−1.2	11, 12	1.8	7.9
Demopolis, Ala.	155	35	20.0	1	4.8	12, 13	7.0	15.2
Black Warrior River.								
Tuscaloosa, Ala	129	43	19.8	23	4.6	12	8.3	15.2
Brazos River.								
Kopperl, Tex.	369	21	6.0	17	0.0	1–16	0.9	6.0
Waco, Tex	301	22	9.6	18	1.0	6–17	3.0	8.6
Booth, Tex.	.....	.....	13.0	27	−0.4	17	3.9	13.4
Columbia River.								
Umatilla, Oreg	270	25	22.1	31	8.4	1	16.2	13.7
The Dalles, Oreg	166	40	36.8	31	12.7	1	25.9	24.1
Willamette River.								
Albany, Oreg	99	20	5.1	20	4.0	31	4.6	1.1
Portland, Oreg	10	15	19.9	31	7.3	3	14.3	12.6
Sacramento River.								
Red Bluff, Cal.	241	23	5.3	1	2.2	31	3.1	3.1
Sacramento, Cal.	70	29	22.2	18	20.1	1,2	21.2	2.1

XXIX—60.

Chart I. Tracks of Centers of High Areas, May, 1901.

Chart I. Tracks of Centers of High Areas. May, 1901.

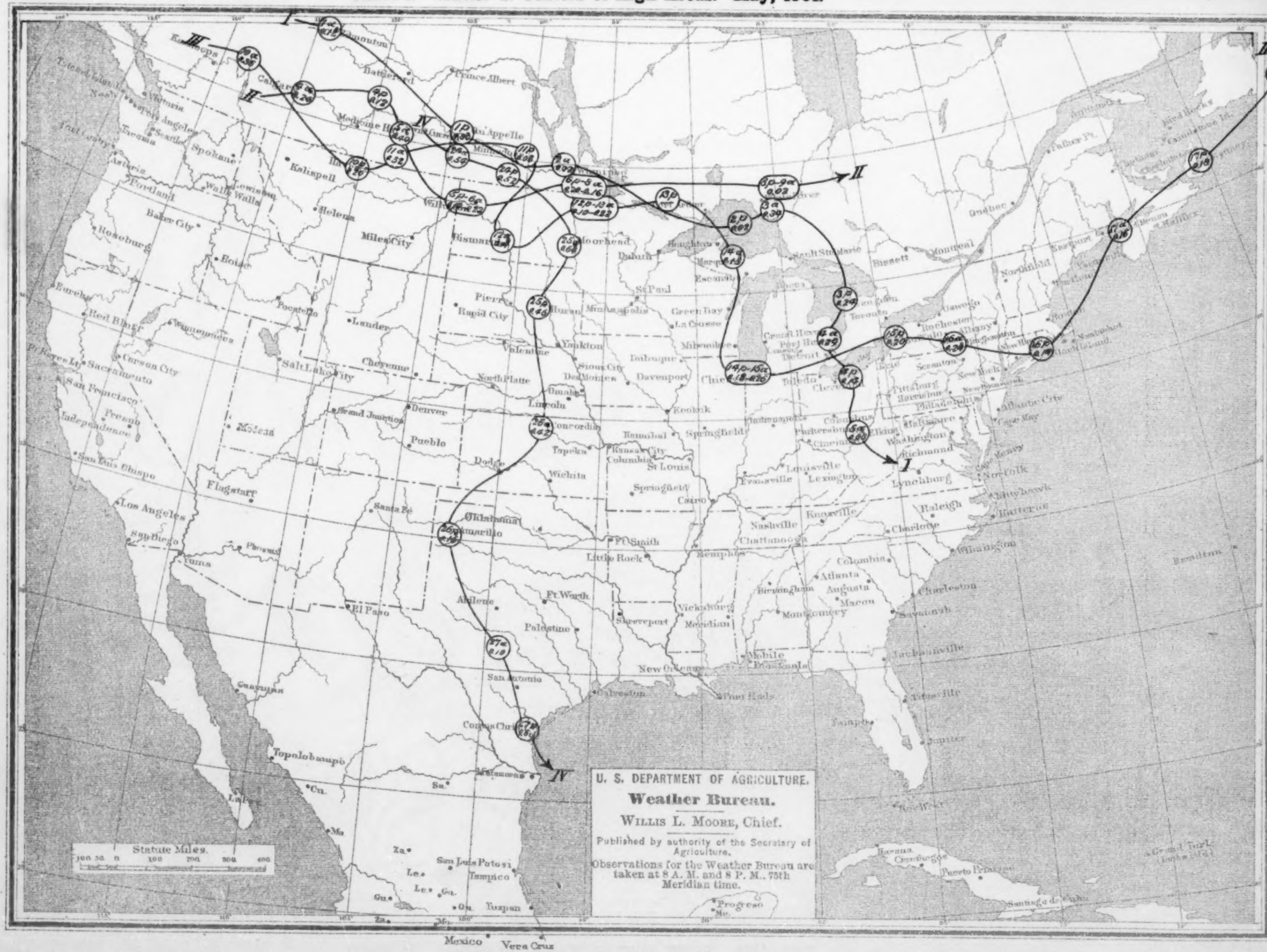

Chart II. Tracks of Centers of Low Areas. May, 1901.

Chart III. Total Precipitation. May, 1901.

Chart III. Total Precipitation. May, 1901.

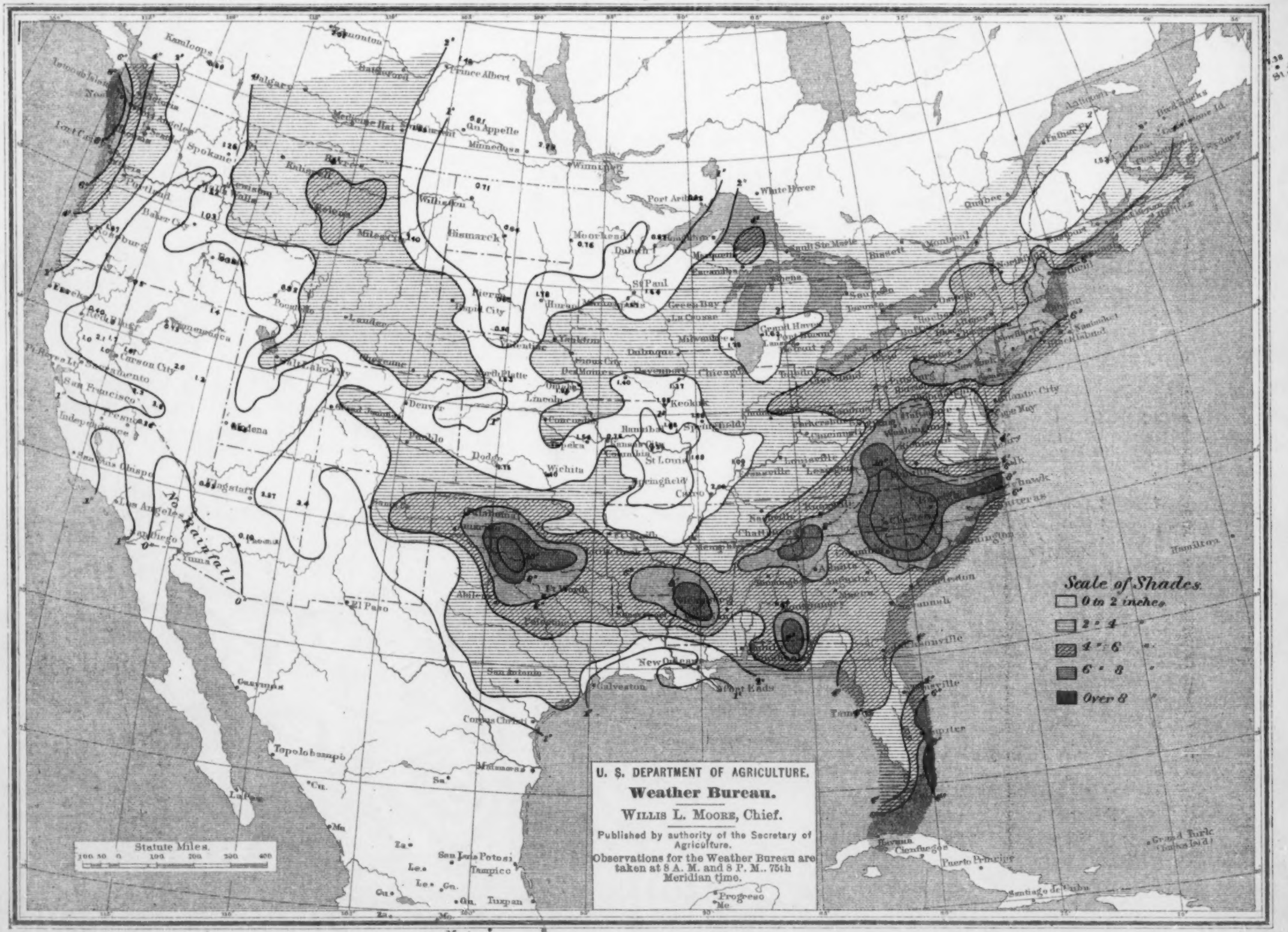

Chart IV. Sea-Level Pressure and Temperature; Resultant Surface Winds. May, 1901.

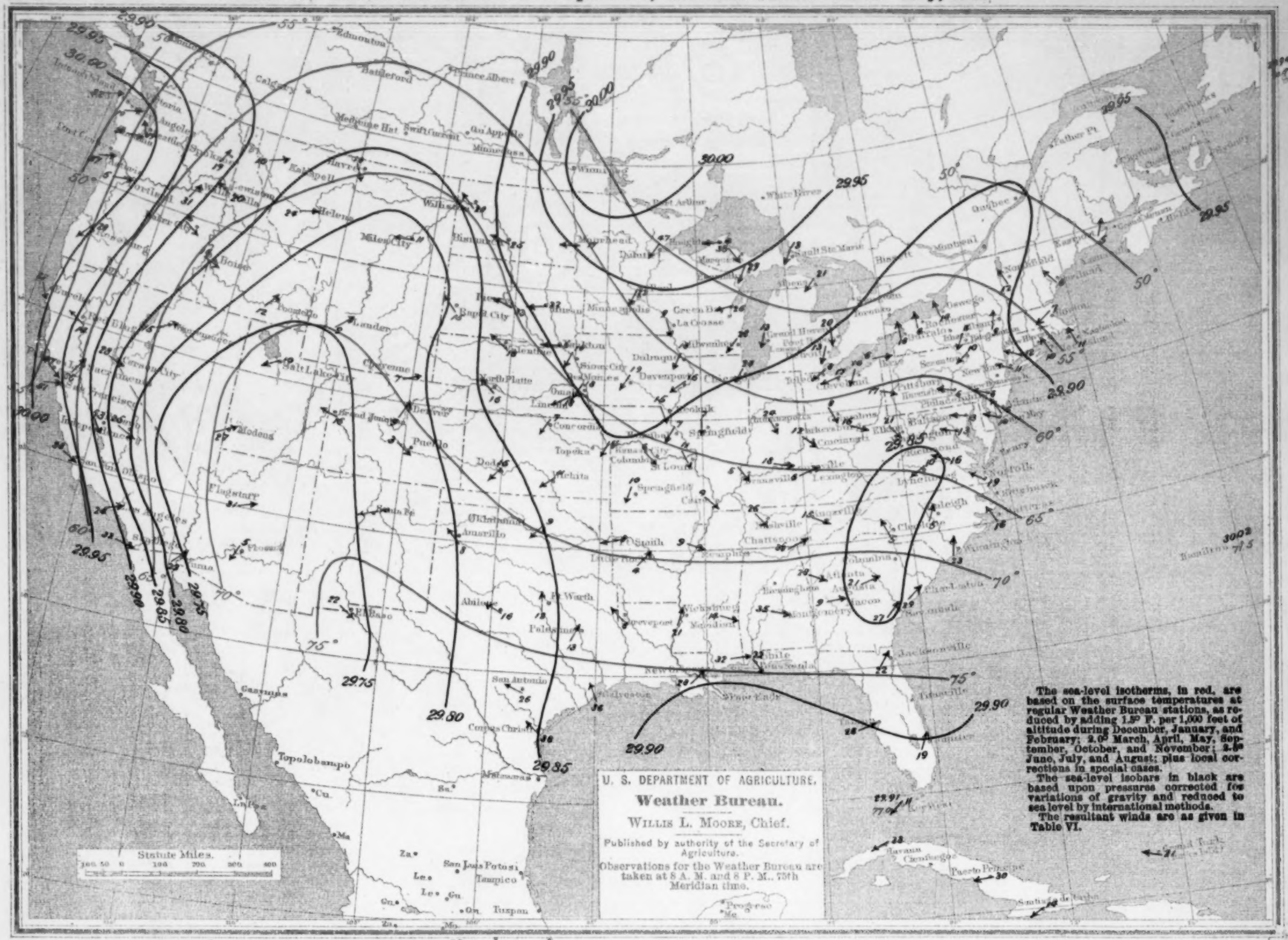

Chart V. Hydrographs for Seven Principal Rivers of the United States. May, 1901.

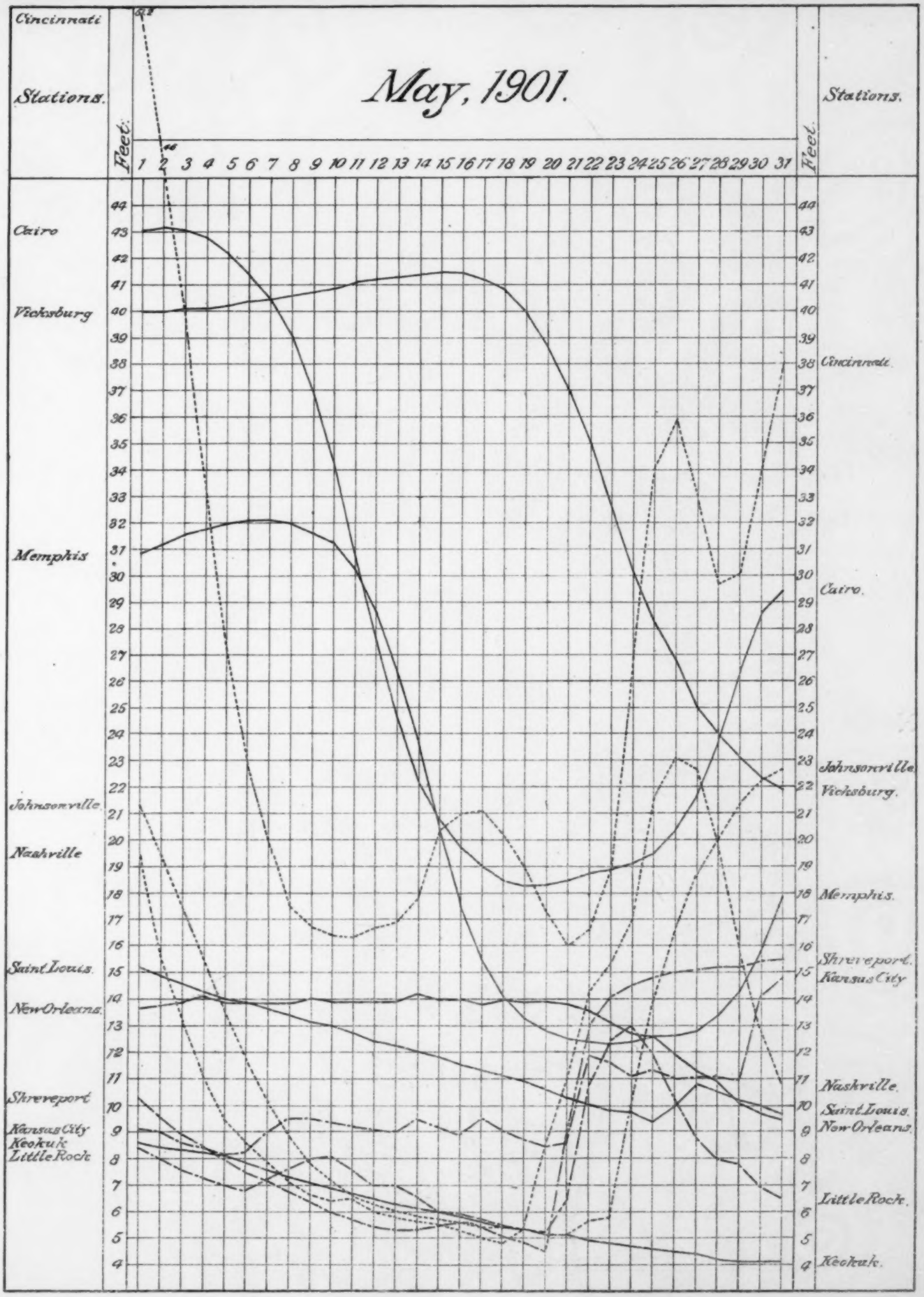

Chart VI. Surface Temperatures; Maximum, Minimum, and Mean. May, 1901.

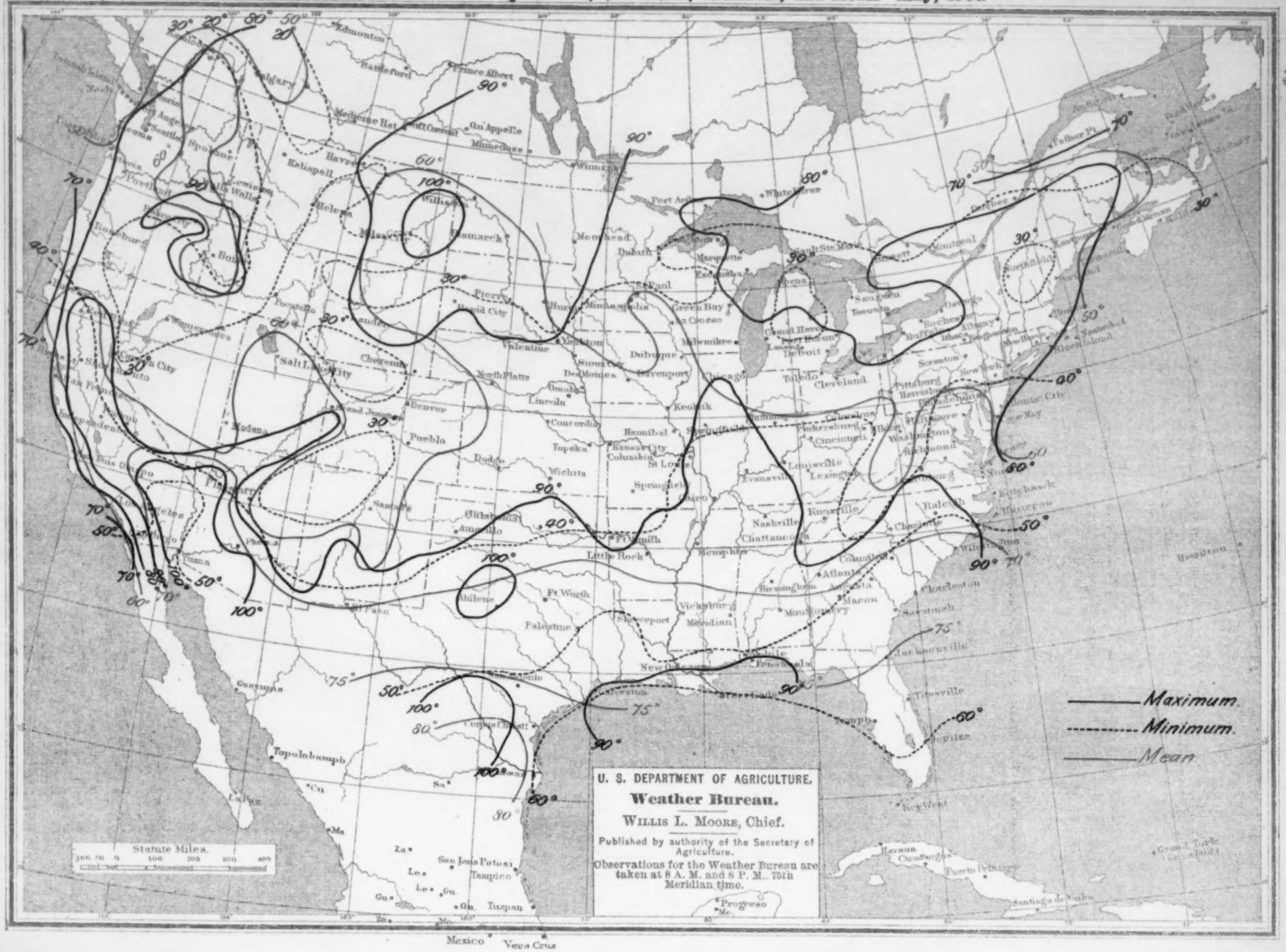

Chart VII. Percentage of Sunshine. May, 1901.

• Bakersville

Chart VII. Percentage of Sunshine. May, 1901.

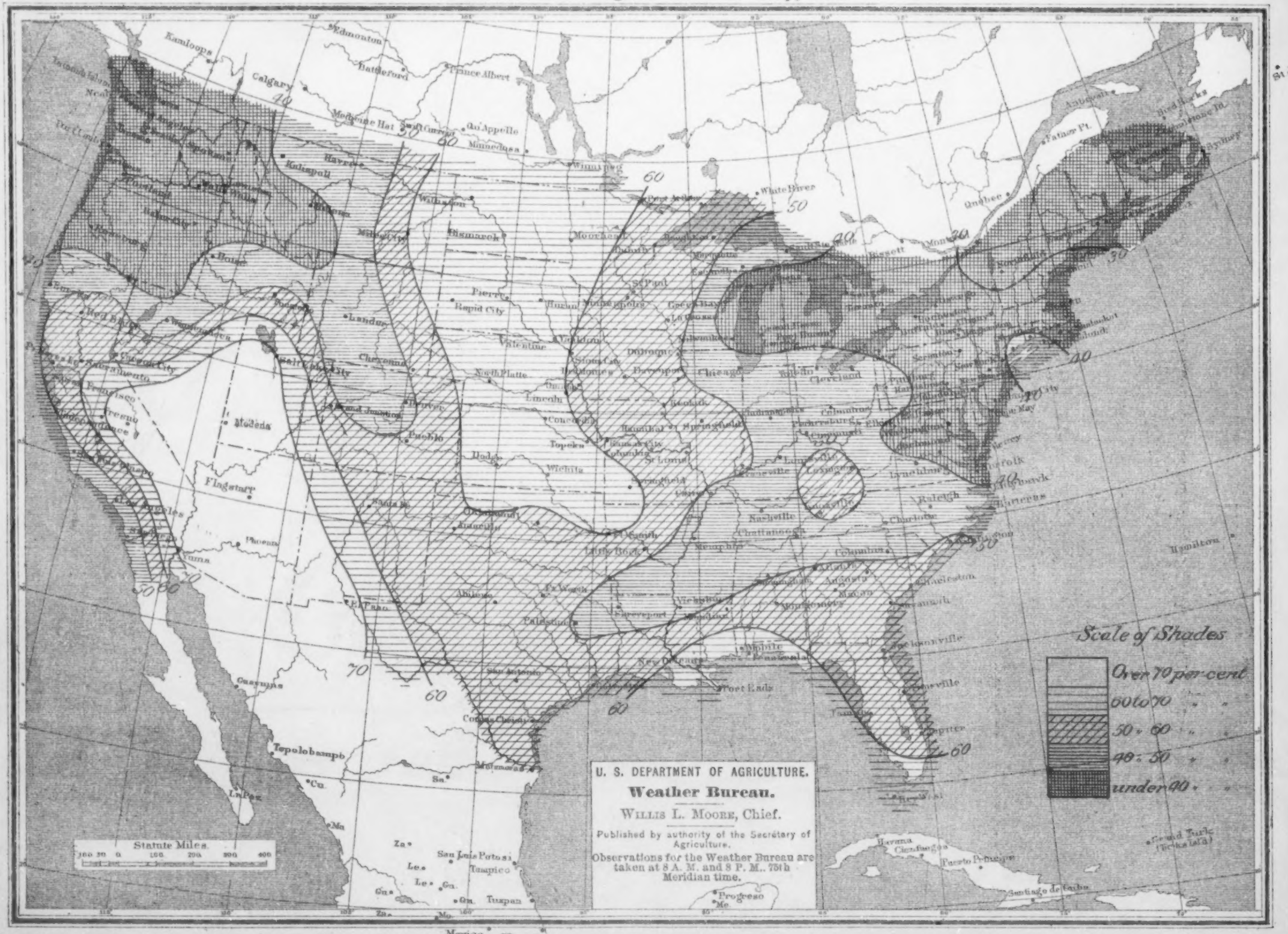

Chart VIII. West Indian Monthly Isobars, Isotherms, and Resultant Winds. May, 1901.

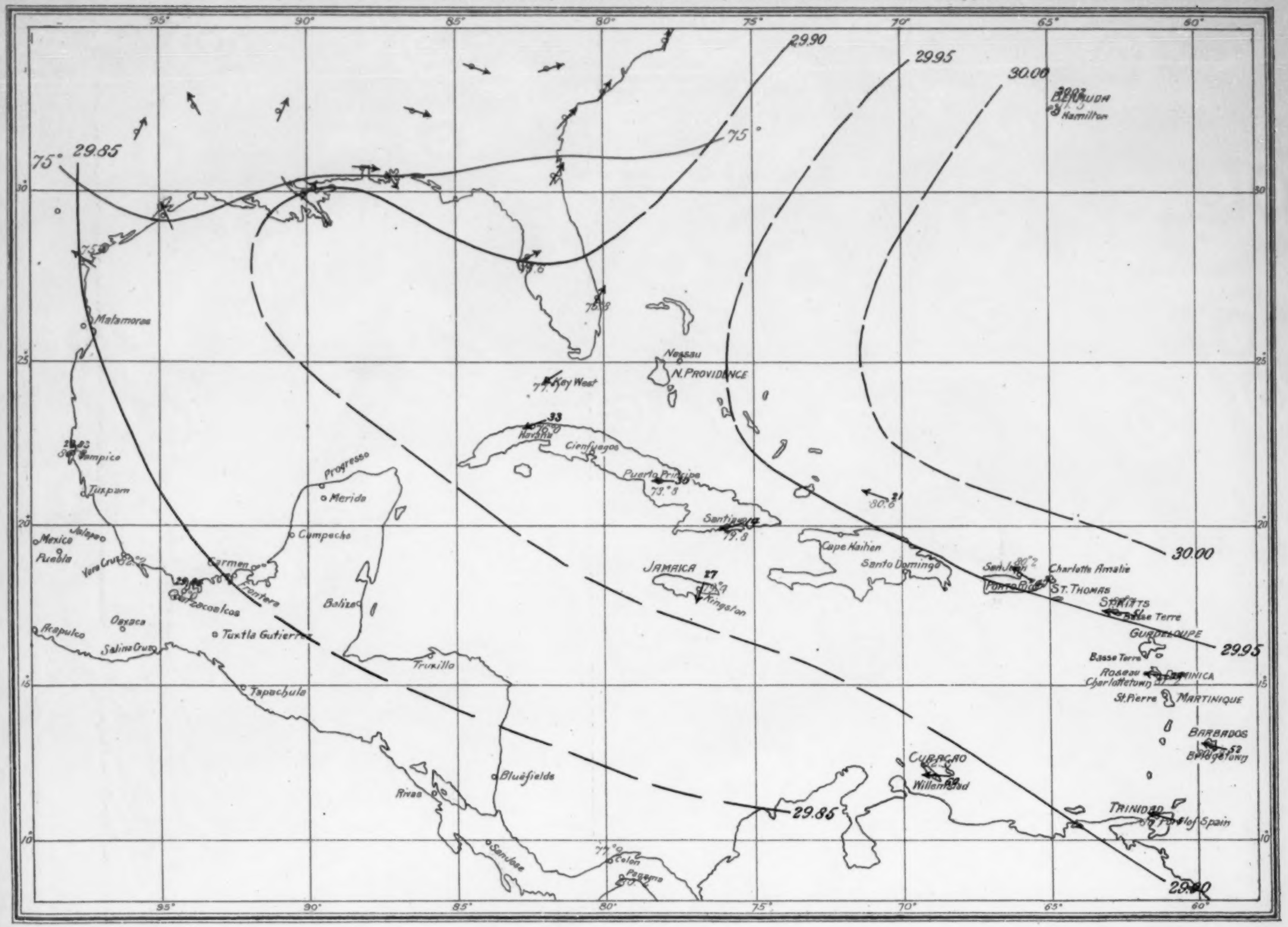

Chart IX. Total Snowfall for May, 1901.

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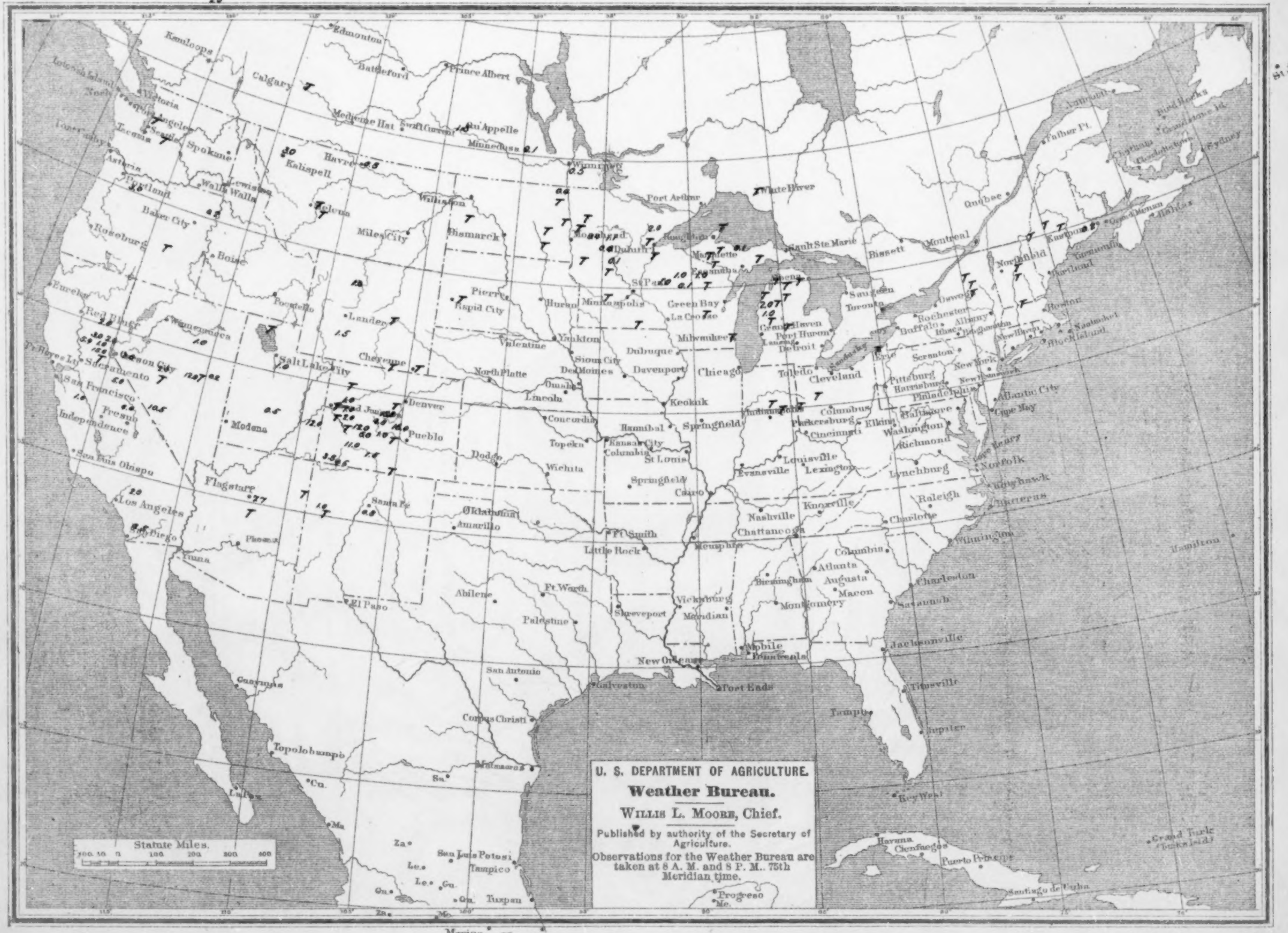
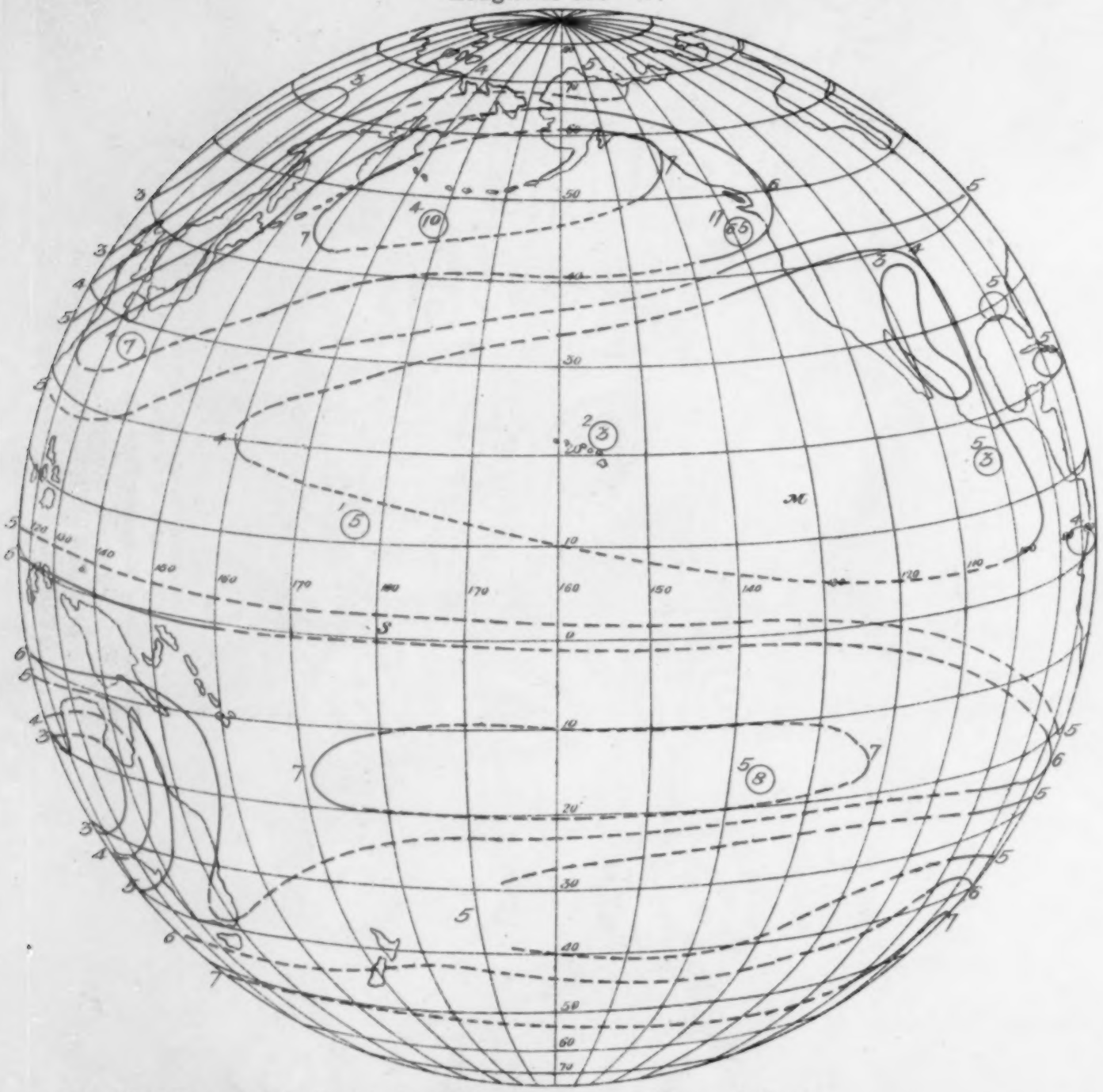


Chart X. Orthographic Projection of a Hemisphere Upon the Horizon of Latitude 10° N., Longitude 160° W.



The lines indicate the normal cloudiness for March (from cloud charts of Teisserenc de Bort).

The figures inclosed in circles indicate the observed average cloudiness at Greenwich midnight, March 22, 1901; the figures to the left and a little above the circle show the number of observations available for determining this average.

S=Sun in zenith.

M=Moon in zenith.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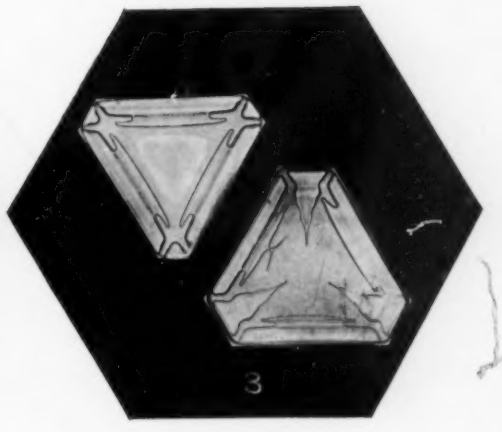
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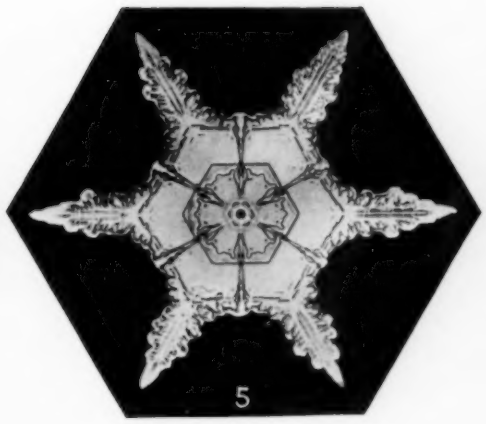
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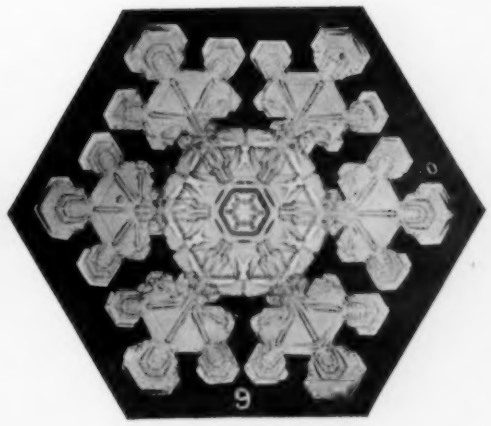
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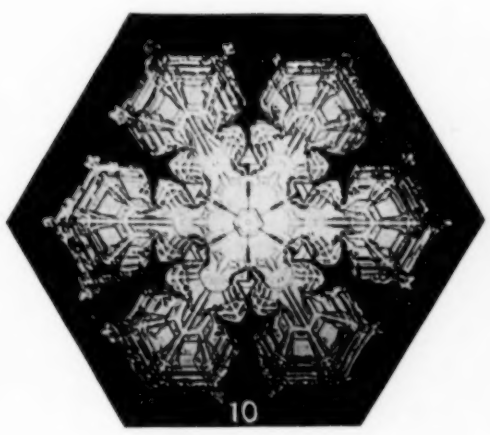
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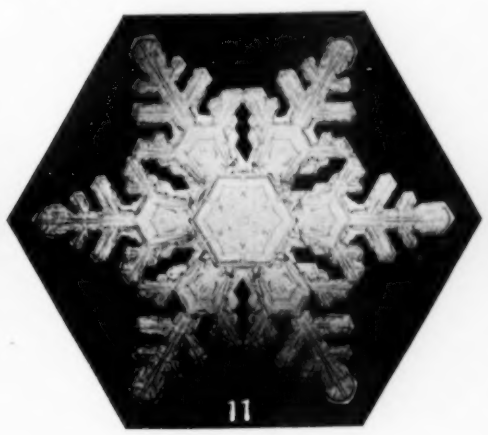
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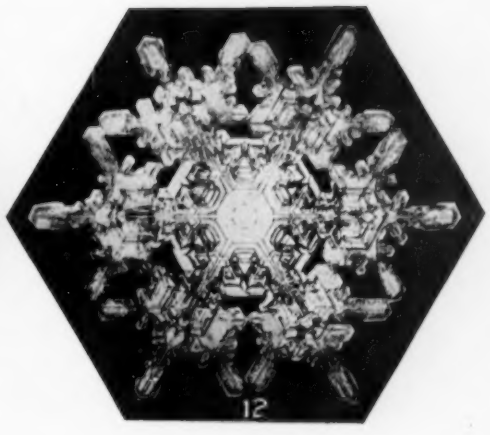
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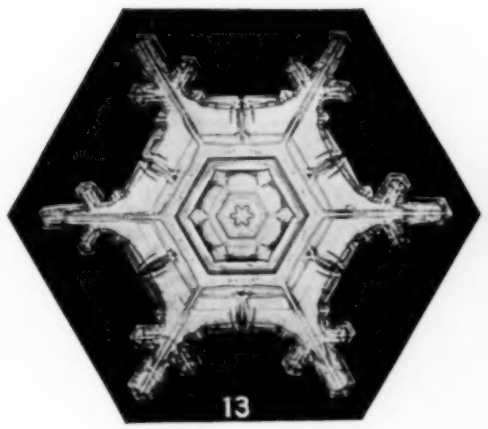
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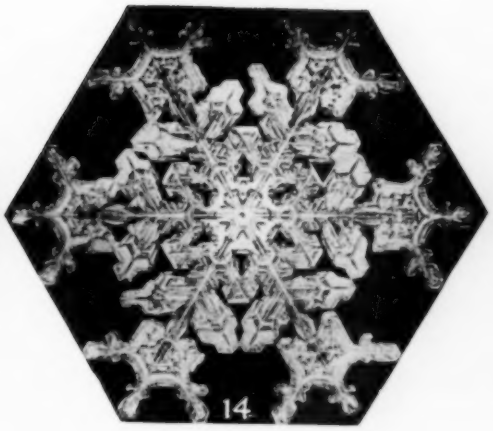
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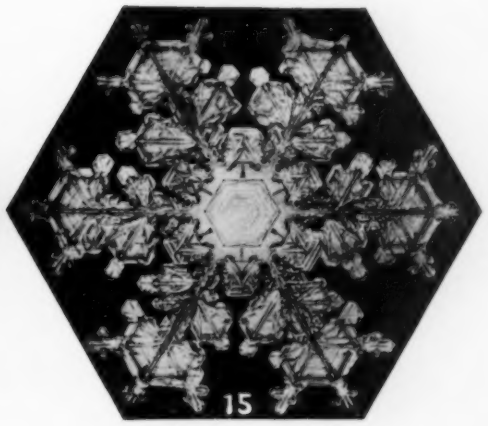
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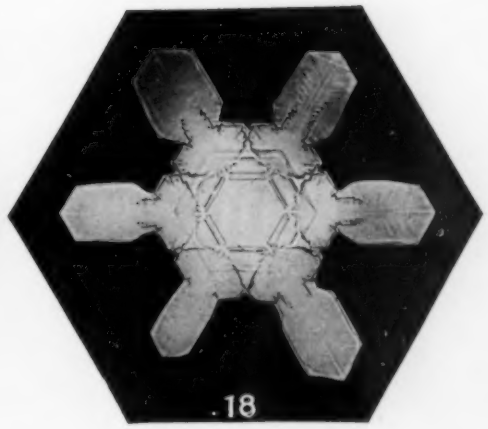
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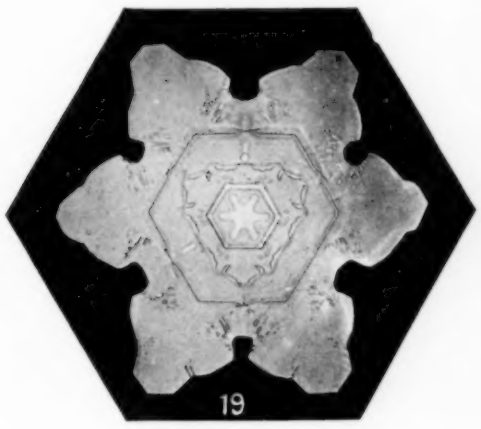
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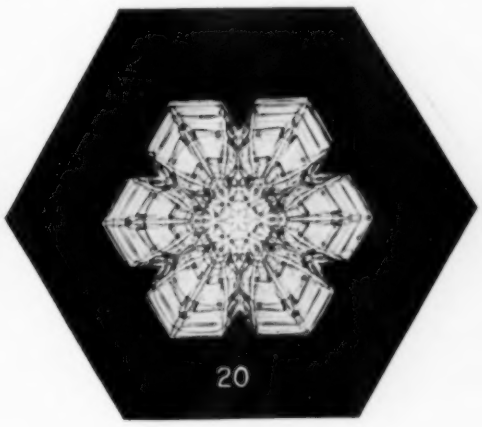
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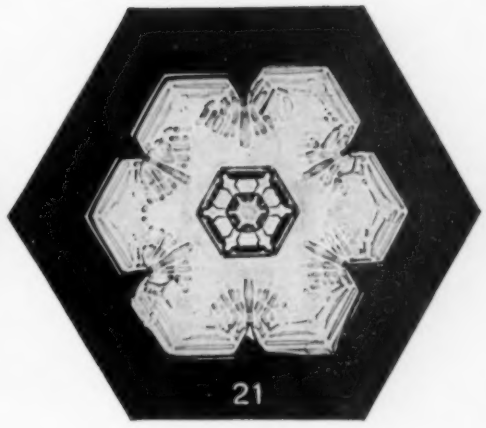
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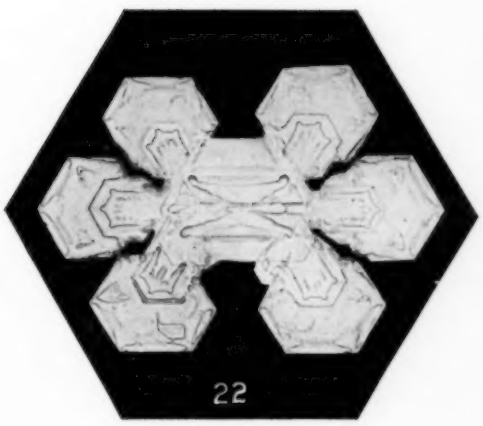
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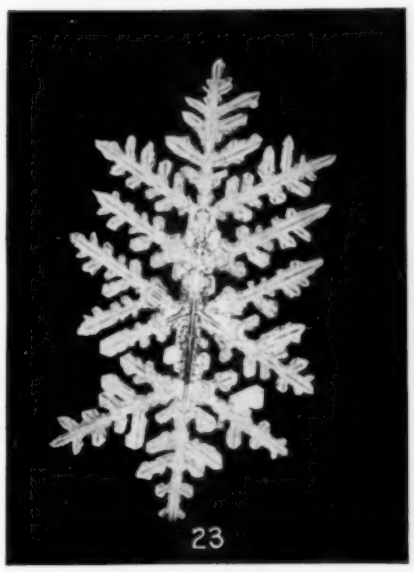
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Mr. Gustavus A. Hyde, Voluntary Observer for Prof. James P. Espy, in 1843.